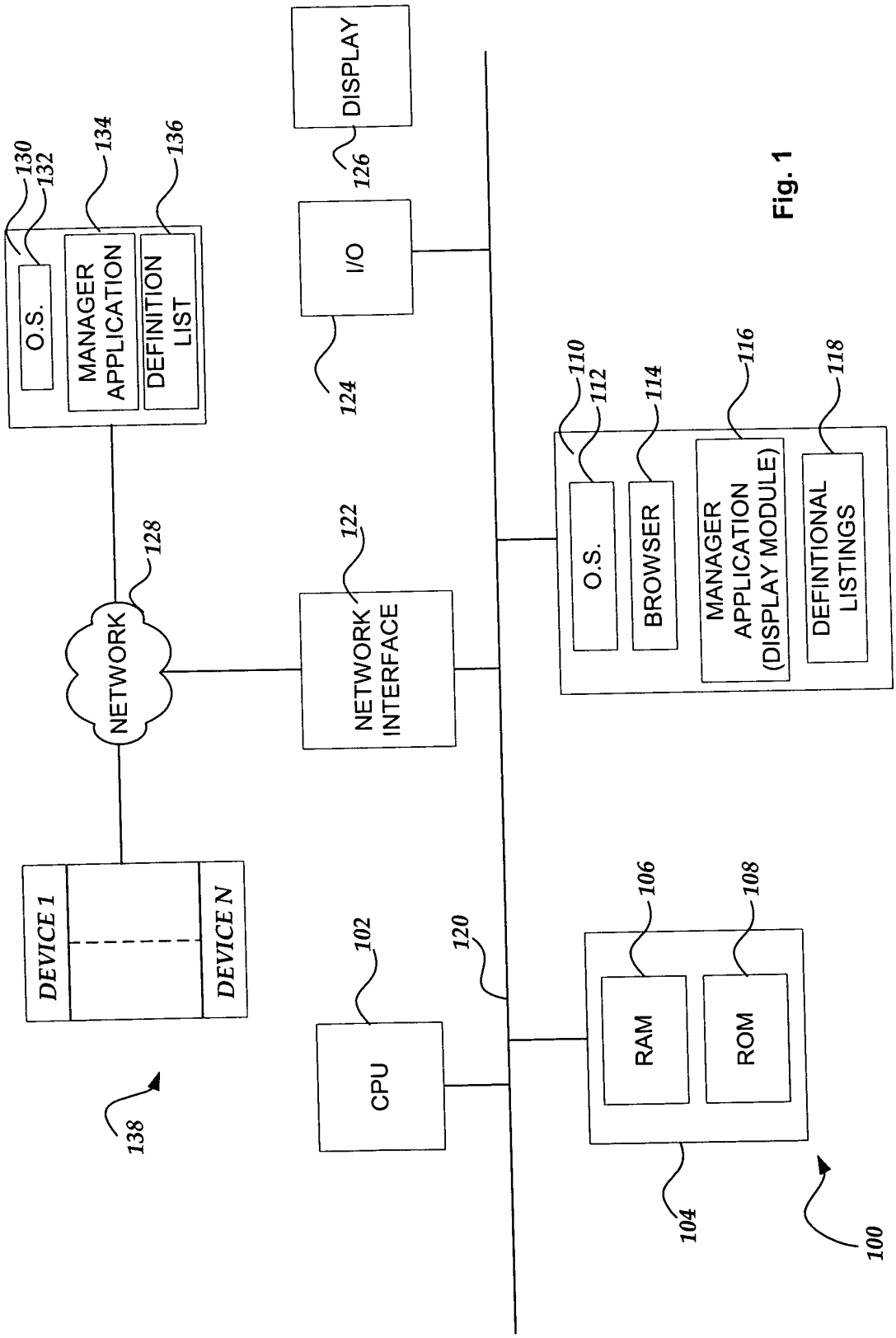

DISPLAY
126
I/O
124
130
132
134
136
O.S.
MANAGER APPLICATION
DEFINITION LIST
128
NETWORK
122
NETWORK INTERFACE
110
112
114
116
118
O.S.
BROWSER
MANAGER APPLICATION (DISPLAY MODULE)
DEFINTIONAL LISTINGS
DEVICE 1
DEVICE N
138
102
CPU
120
106
108
RAM
ROM
104
100

Fig. 1

Acme Router & Rocket, Inc.

Network	ID	Parent	Address Type	Allocation Type & Order	Aggregate	Lending Limits (Min/Max)	Reuse Interval	Description	Address Blocks	Block Status
Acme	1	0	IPv4	Rated Fit Low	Y	/28 - /26 (210 / 220)	0	Acme Routers & Rockets (230 / 240)	192.168.120.144 /28 192.168.120.208 /28 192.168.120.224 /30 192.168.120.228 /30 192.168.120.232 /29 192.168.120.240 /28	Free Free Connection Free Free Delegated
Accounting	3	1	IPv4	Utilization Fit Low	Y	None	0	Accounting Dept.	192.168.120.128 /29 192.168.120.136 /29	Connection Free
Engineering	4	1	IPv4	Utilization Fit Low	Y	None	0	Engineering Dept.	192.168.120.64 /26	Connection
LAB	5	4	IPv4	Utilization Fit Low	N	None	0	Lab Area	10.10.10.0 /24	Allocated
Headquarters	2	1	IPv4	Utilization Fit Low	Y	None	0	Acme headquarters	192.168.120.0 /26	Connection
Manufacturing	9	1	IPv4	Utilization Fit Low	Y	None	0	Manufacturing Dept.		
Assembly Line	10	9	IPv4	Utilization Fit Low	Y	None	0	Assembly Line		
Sales	6	1	IPv4	Rated Fit Low	Y	/28 - /27	0	Sales Dept.	192.168.120.160 /29 192.168.120.168 /31 192.168.120.170 /31 192.168.120.172 /30	Connection Connection Free Connection
Sales East	7	6	IPv4	Utilization Fit Low	Y	None	0	Eastern Sales office	192.168.120.176 /29 192.168.120.184 /29	Connection Free
Sales West	8	6	IPv4	Utilization Fit Low	Y	None	0	Western Sales Region	192.168.120.192 /29 192.168.120.200 /29	Connection Free

Fig 2

Inventor: Dennis J. Boylan; Kenneth D. Burroughs; Sean M. Drum; John L. Lee; Angela K. Schneider
Docket No.: 60088.00021US01
Title: Methods, Computer Systems, and Computer Readable Media For Controlling the Status of Network Address Space
Attorney Name: Jeramie J. Keys, Esq.
Phone No.: 404.954.5040
Sheet 2 of 37

Acme Router & Rocket, Inc.

Network	Address Blocks	Size	Status	Aggregate Blocks	Aggregate with Descendants	Addresses Used	Total	%Utilization
⊟ (4) Acme	192.168.120.144 /28	16	Free	192.168.120.144 /28 192.168.120.208 /28 192.168.120.224 /27	192.168.120.0 /24	Local 20	64	
	192.168.120.208 /28	16	Free			Agg. 186	256	72.656%
	192.168.120.224 /30	4	Connection					
	192.168.120.228 /30	4	Free					
	192.168.120.232 /29	8	Free					
	192.168.120.240 /28	16	Delegated					
(4) Accounting	192.168.120.128 /29	8	Connection	192.168.120.128 /28	192.168.120.128 /28	8	16	50%
	192.168.120.136 /29	8	Free					
⊟ (4) Engineering	192.168.120.64 /26	64	Connection	192.168.120.64 /26	192.168.120.64 /26	64	64	100%
(4) LAB	10.10.10.0 /24	256	Allocated	10.10.10.0 /24	10.10.10.0 /24	256	256	100%
⊟ (4) Headquarters	192.168.120.0 /26	64	Connection	192.168.120.0 /26	192.168.120.0 /26	64	64	100%
⊟ (4) Manufacturing						Local 0 Agg. 0	0 0	
(4) Assembly Line						0	0	
⊟ (4) Sales	192.168.120.160 /29	8	Connection	192.168.120.160 /28	192.168.120.160 /27 192.168.120.192 /28	Local 14	16	
	192.168.120.168 /30	2	Connection			Agg 30	48	62.5%
	192.168.120.170 /30	2	Free					
	192.168.120.172 /30	4	Connection					
(4) Sales East	192.168.120.176 /29	8	Connection	192.168.120.176 /28	192.168.120.176 /28	8	16	50%
	192.168.120.184 /29	8	Free					
(4) Sales West	192.168.120.192 /29	8	Connection	192.168.120.192 /28	192.168.120.192 /28	8	16	50%
	192.168.120.200 /29	8	Free					

Fig 2A

Inventor: Dennis J. Boylan; Kenneth D. Burroughs; Sean M. Drun; John L. Lee;
Angela K. Schneider
Docket No.: 60088.0002US01
Title: Methods, Computer Systems, and Computer Readable Media For Controlling the Status of Network Address Space
Attorney Name: Jeramie J. Keys, Esq.
Phone No.: 404.954.5040
Sheet 3 of 37

Fig. 3

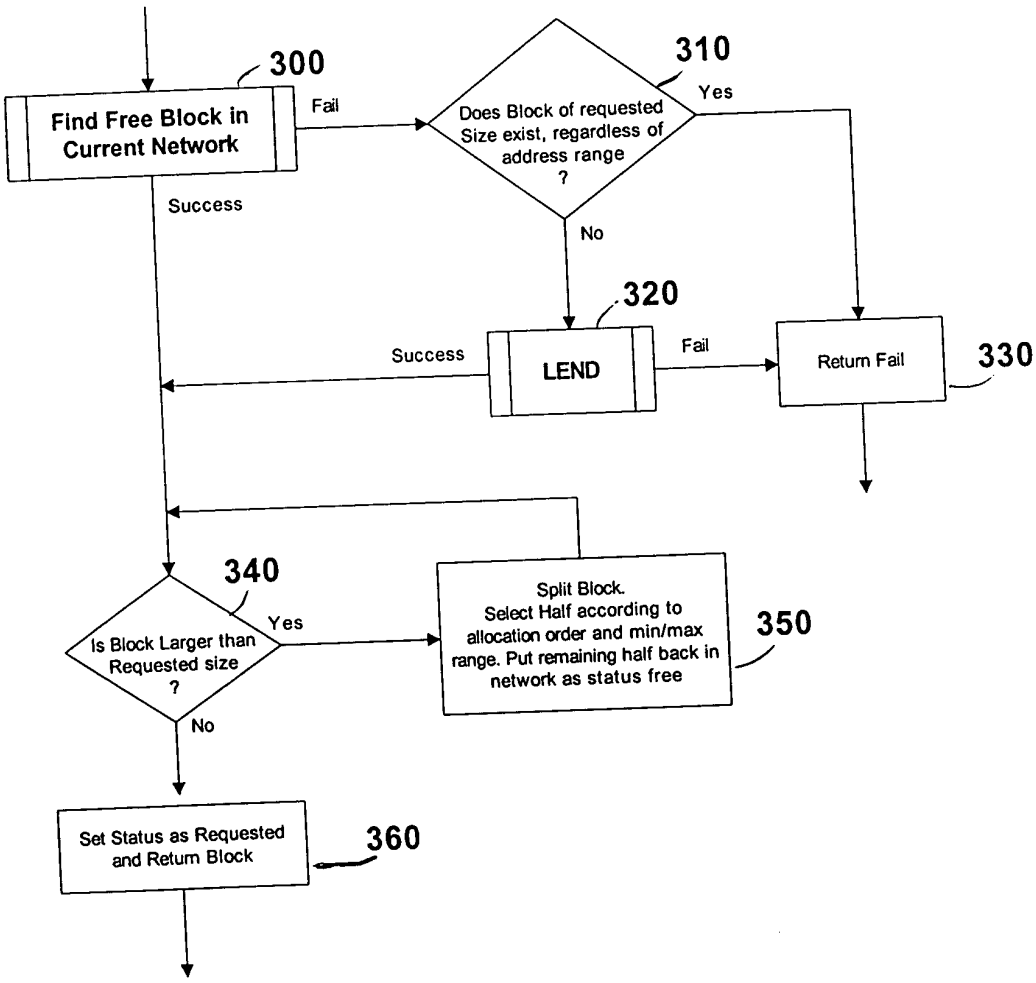

300
Find Free Block in Current Network
Fail
310
Does Block of requested Size exist, regardless of address range ?
Yes
Success
No
320
Success
LEND
Fail
Return Fail
330
340
Is Block Larger than Requested size ?
Yes
Split Block. Select Half according to allocation order and min/max range. Put remaining half back in network as status free
350
No
Set Status as Requested and Return Block
360

Fig 4

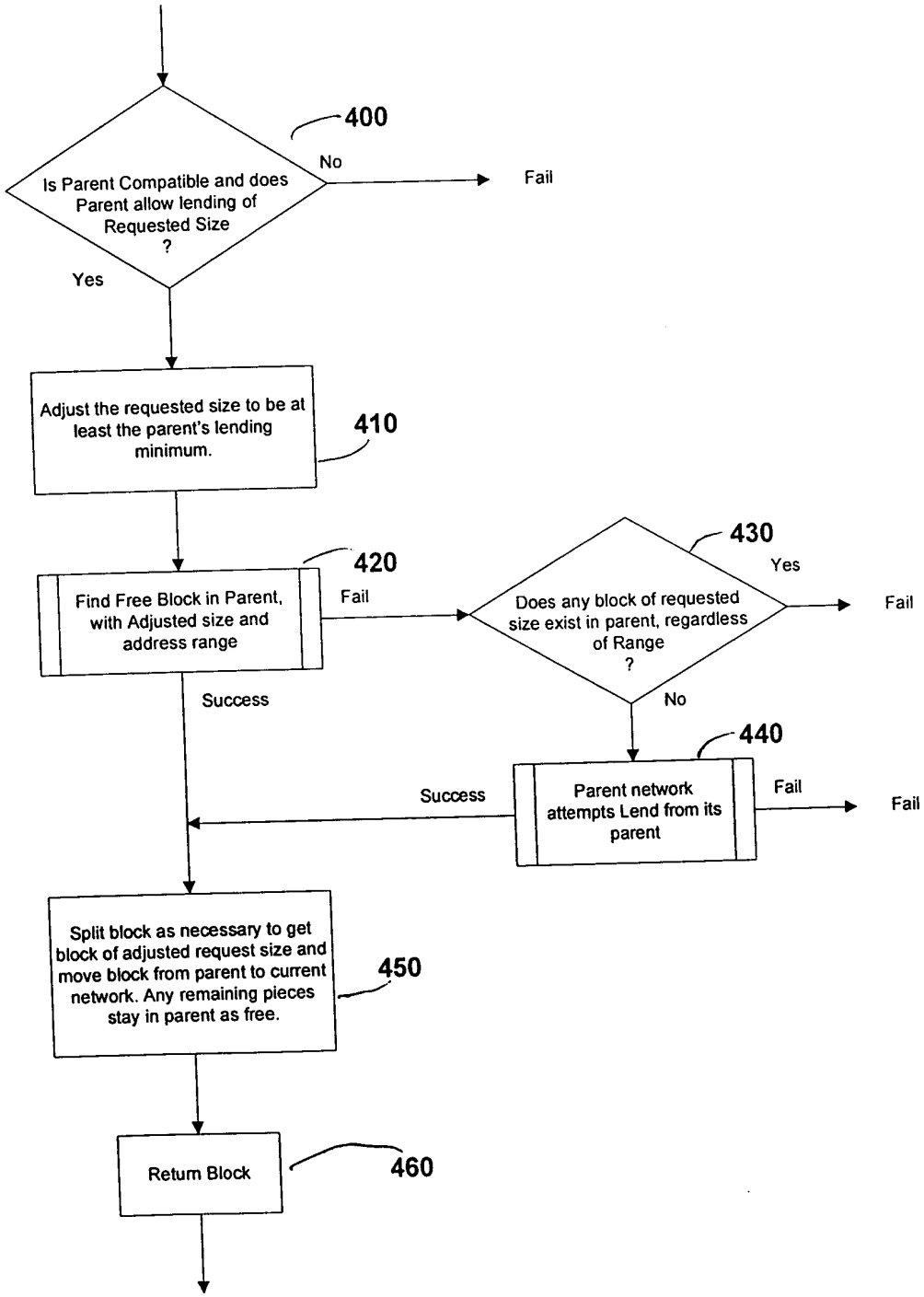

400
Is Parent Compatible and does Parent allow lending of Requested Size ?
No
Fail
Yes
Adjust the requested size to be at least the parent's lending minimum.
410
420
Find Free Block in Parent, with Adjusted size and address range
Fail
430
Does any block of requested size exist in parent, regardless of Range ?
Yes
Fail
No
Success
440
Parent network attempts Lend from its parent
Success
Fail
Fail
Split block as necessary to get block of adjusted request size and move block from parent to current network. Any remaining pieces stay in parent as free.
450
Return Block
460

Fig 5

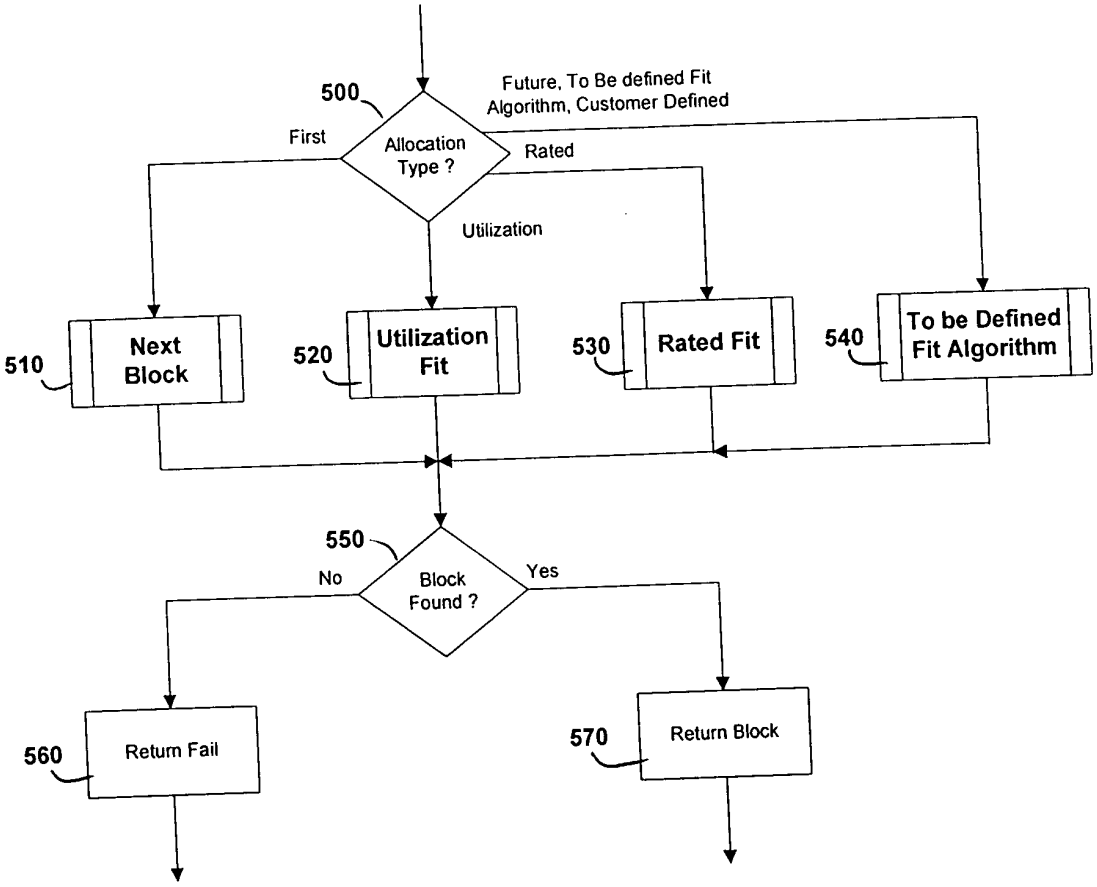

500
Allocation Type ?
First
Utilization
Rated
Future, To Be defined Fit Algorithm, Customer Defined
510
Next Block
520
Utilization Fit
530
Rated Fit
540
To be Defined Fit Algorithm
550
Block Found ?
No
Yes
560
Return Fail
570
Return Block

Fig 6

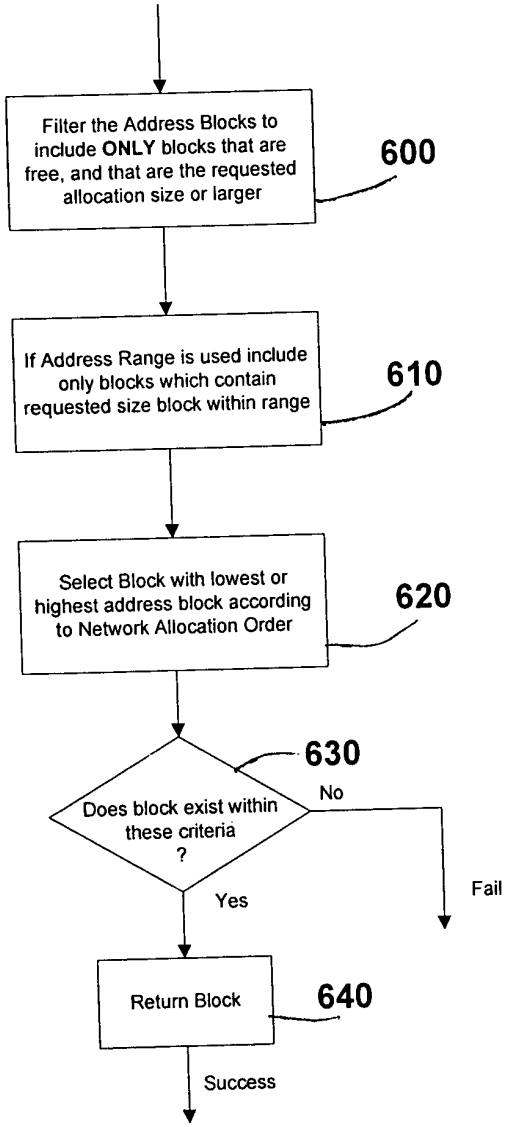

Filter the Address Blocks to include ONLY blocks that are free, and that are the requested allocation size or larger
600
If Address Range is used include only blocks which contain requested size block within range
610
Select Block with lowest or highest address block according to Network Allocation Order
620
630
Does block exist within these criteria ?
No
Fail
Yes
Return Block
640
Success

Fig 7

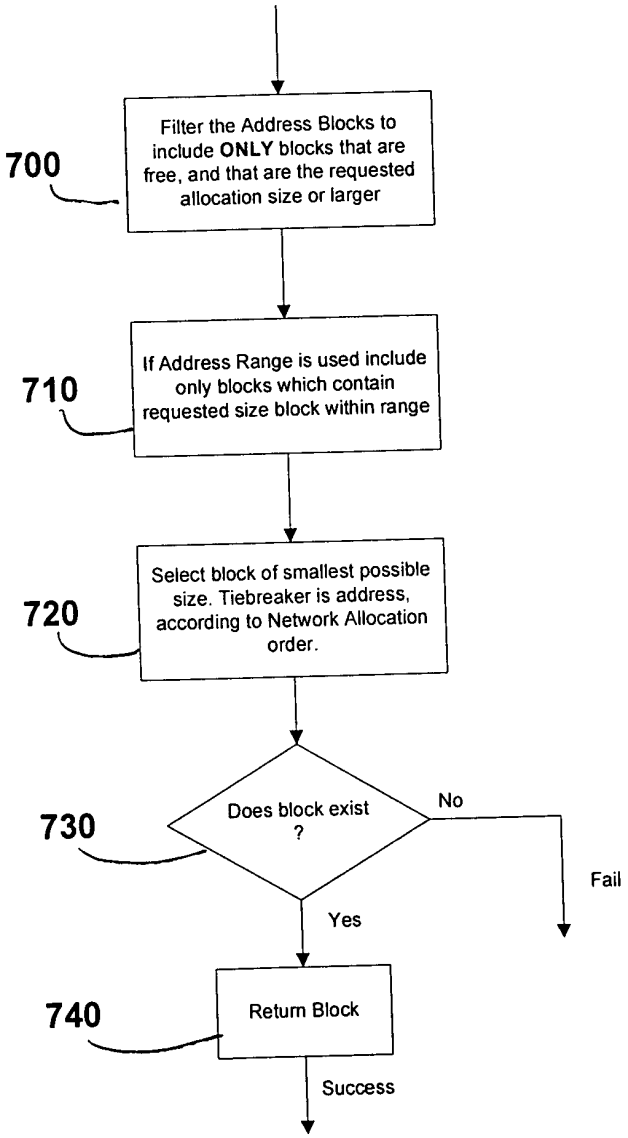

700
Filter the Address Blocks to include ONLY blocks that are free, and that are the requested allocation size or larger
710
If Address Range is used include only blocks which contain requested size block within range
720
Select block of smallest possible size. Tiebreaker is address, according to Network Allocation order.
730
Does block exist ?
No
Fail
Yes
740
Return Block
Success

Fig 8

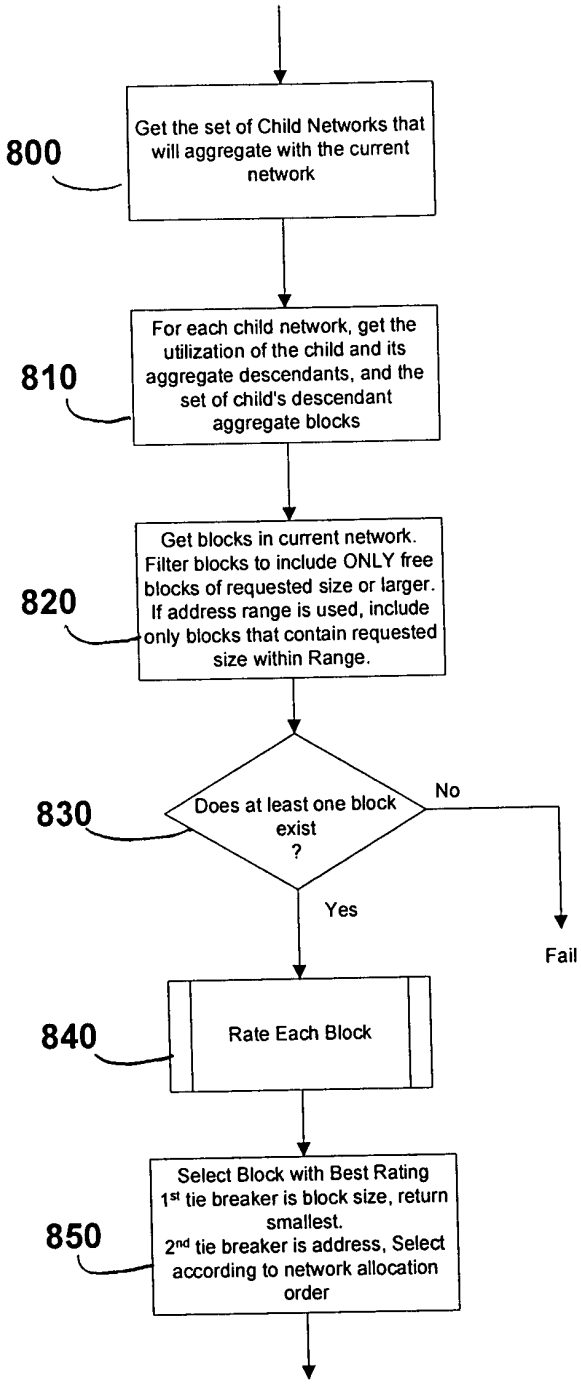

800
Get the set of Child Networks that will aggregate with the current network
810
For each child network, get the utilization of the child and its aggregate descendants, and the set of child's descendant aggregate blocks
820
Get blocks in current network. Filter blocks to include ONLY free blocks of requested size or larger. If address range is used, include only blocks that contain requested size within Range.
830
Does at least one block exist ?
No
Fail
Yes
840
Rate Each Block
850
Select Block with Best Rating
1st tie breaker is block size, return smallest.
2nd tie breaker is address, Select according to network allocation order

Fig 9

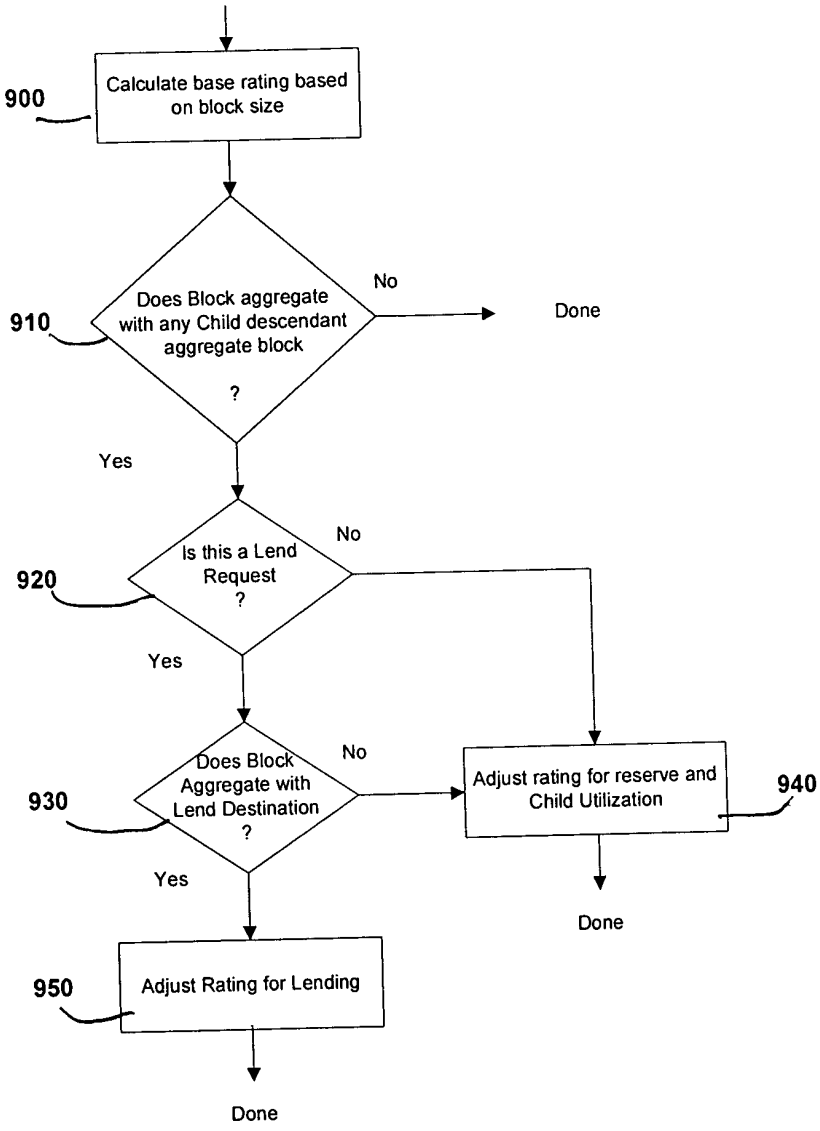
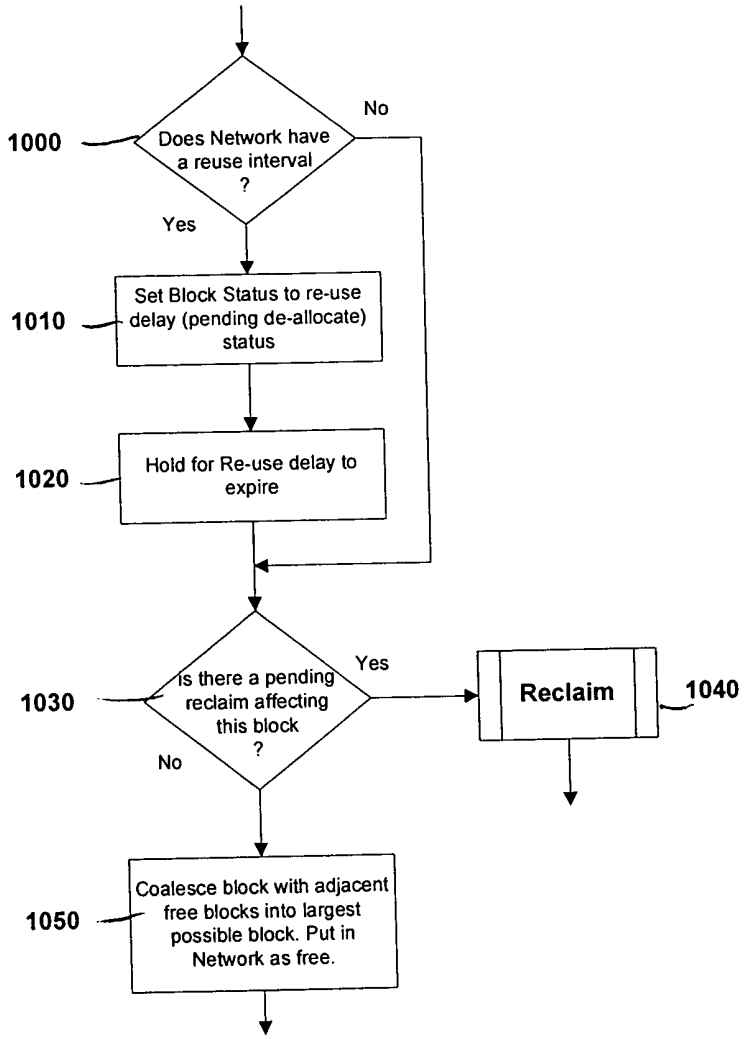

900
Calculate base rating based on block size
910
Does Block aggregate with any Child descendant aggregate block ?
No
Done
Yes
920
Is this a Lend Request ?
No
Yes
930
Does Block Aggregate with Lend Destination ?
No
Adjust rating for reserve and Child Utilization
940
Done
Yes
950
Adjust Rating for Lending
Done

Fig 10


1000
Does Network have a reuse interval ?
No
Yes
1010
Set Block Status to re-use delay (pending de-allocate) status
1020
Hold for Re-use delay to expire
1030
Is there a pending reclaim affecting this block ?
Yes
No
Reclaim
1040
1050
Coalesce block with adjacent free blocks into largest possible block. Put in Network as free.

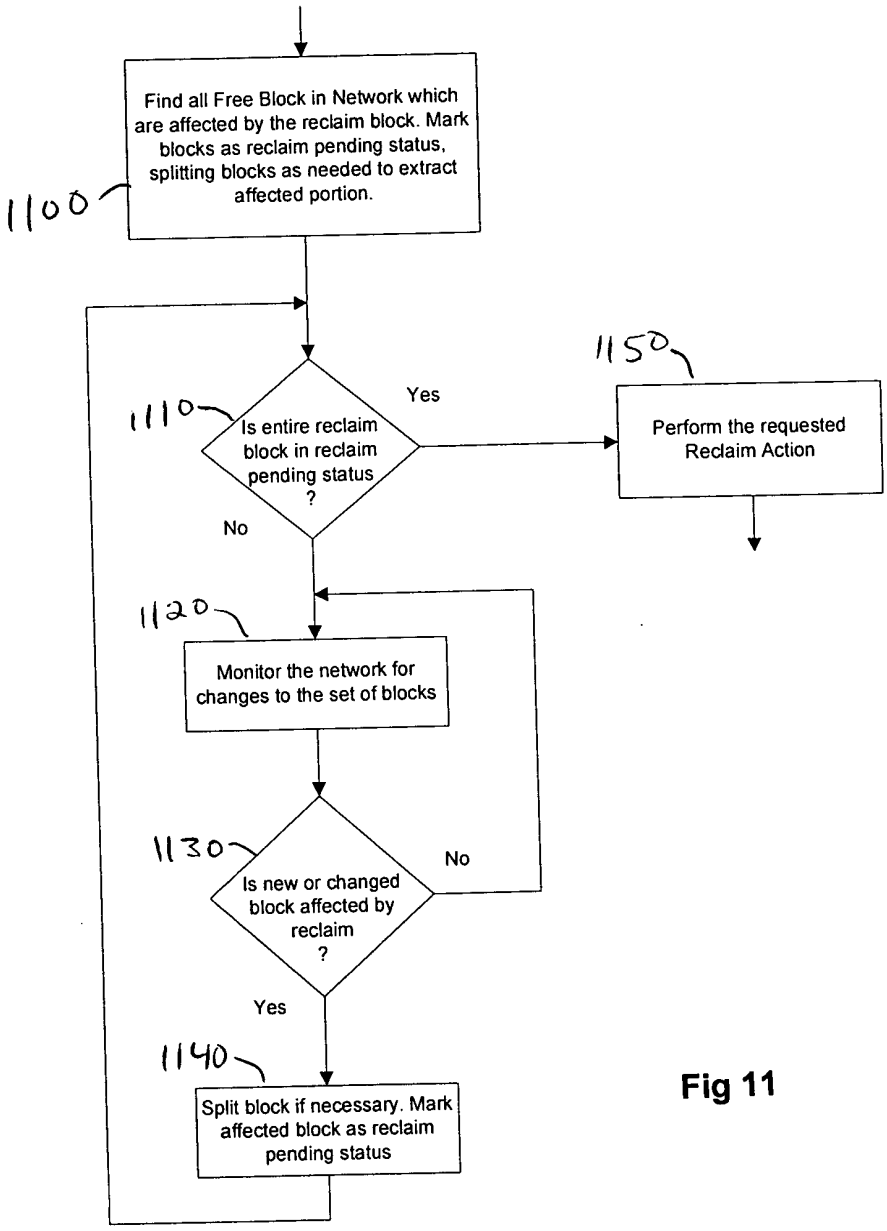

Find all Free Block in Network which are affected by the reclaim block. Mark blocks as reclaim pending status, splitting blocks as needed to extract affected portion.
1100
Is entire reclaim block in reclaim pending status ?
1110
Yes
No
Perform the requested Reclaim Action
1150
Monitor the network for changes to the set of blocks
1120
Is new or changed block affected by reclaim ?
1130
No
Yes
Split block if necessary. Mark affected block as reclaim pending status
1140

Fig 11

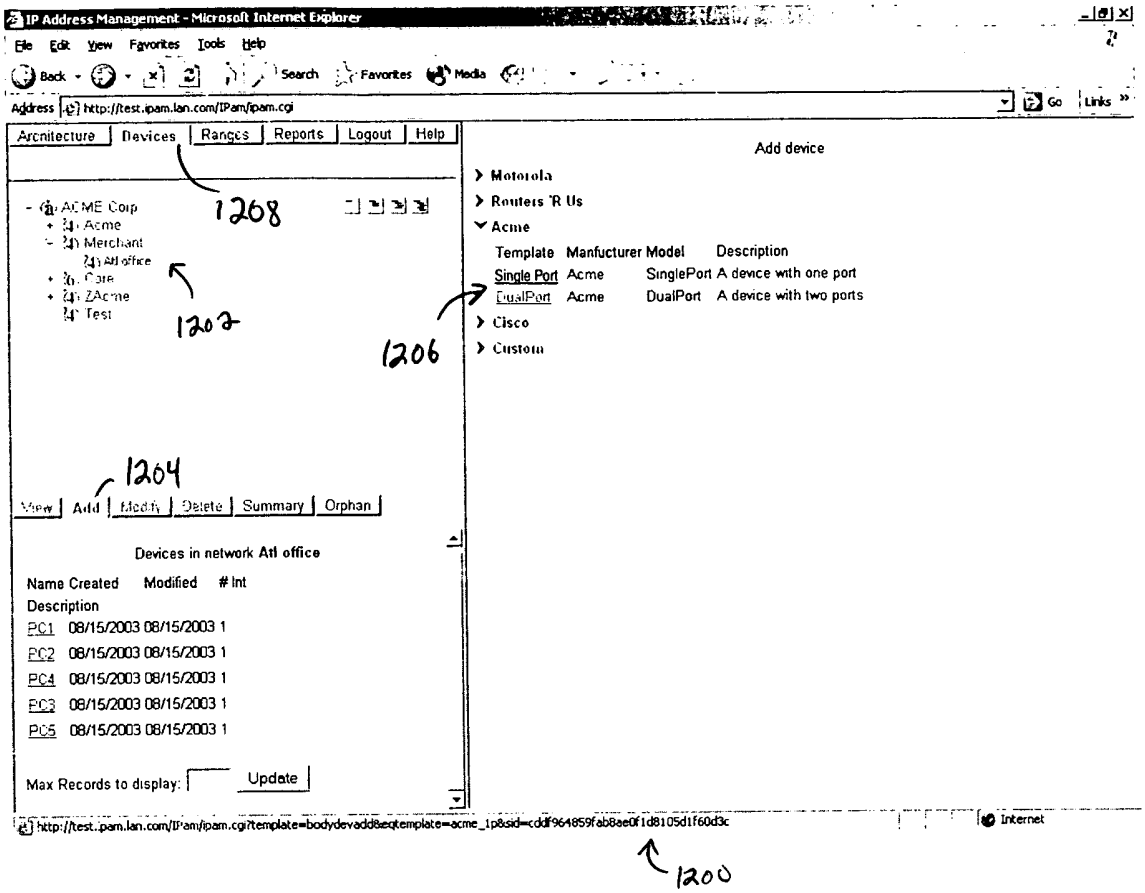

IP Address Management - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://test.ipam.lan.com/IPam/ipam.cgi
Go Links
Architecture Devices Ranges Reports Logout Help
1208
ACME Corp
Acme
Merchant
Atl office
Care
ZAcme
Test
1202
1206
Add device
Motorola
Routers 'R Us
Acme
Template Manfucturer Model Description
Single Port Acme SinglePort A device with one port
DualPort Acme DualPort A device with two ports
Cisco
Custom
1204
View Add Modify Delete Summary Orphan
Devices in network Atl office
Name Created Modified # Int
Description
PC1 08/15/2003 08/15/2003 1
PC2 08/15/2003 08/15/2003 1
PC4 08/15/2003 08/15/2003 1
PC3 08/15/2003 08/15/2003 1
PC5 08/15/2003 08/15/2003 1
Max Records to display: Update
http://test.ipam.lan.com/IPam/ipam.cgi?template=bodydevadd&eqtemplate=acme_1p&sid=cddf964859fab8ae0f1d8105d1f60d3c
Internet
1200

Fig 12

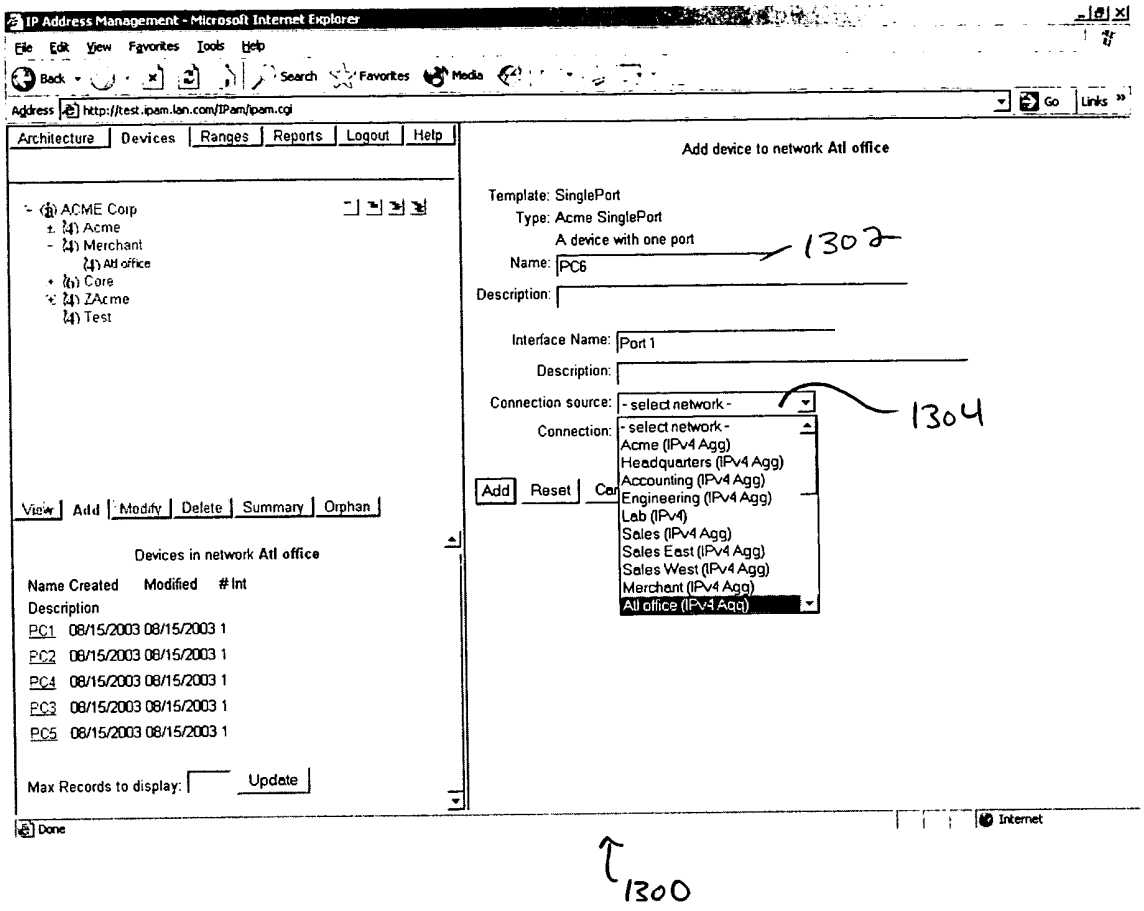

IP Address Management - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://test.ipam.lan.com/IPam/ipam.cgi
Go Links
Architecture Devices Ranges Reports Logout Help
ACME Corp
Acme
Merchant
Atl office
Core
ZAcme
Test
View Add Modify Delete Summary Orphan
Devices in network Atl office
Name Created Modified # Int
Description
PC1 08/15/2003 08/15/2003 1
PC2 08/15/2003 08/15/2003 1
PC4 08/15/2003 08/15/2003 1
PC3 08/15/2003 08/15/2003 1
PC5 08/15/2003 08/15/2003 1
Max Records to display: Update
Add device to network Atl office
Template: SinglePort
Type: Acme SinglePort
A device with one port
Name: PC6
1302
Description:
Interface Name: Port 1
Description:
Connection source: - select network -
1304
Connection:
- select network -
Acme (IPv4 Agg)
Headquarters (IPv4 Agg)
Accounting (IPv4 Agg)
Engineering (IPv4 Agg)
Lab (IPv4)
Sales (IPv4 Agg)
Sales East (IPv4 Agg)
Sales West (IPv4 Agg)
Merchant (IPv4 Agg)
Atl office (IPv4 Agg)
Add Reset
Done
Internet
1300

Fig 13

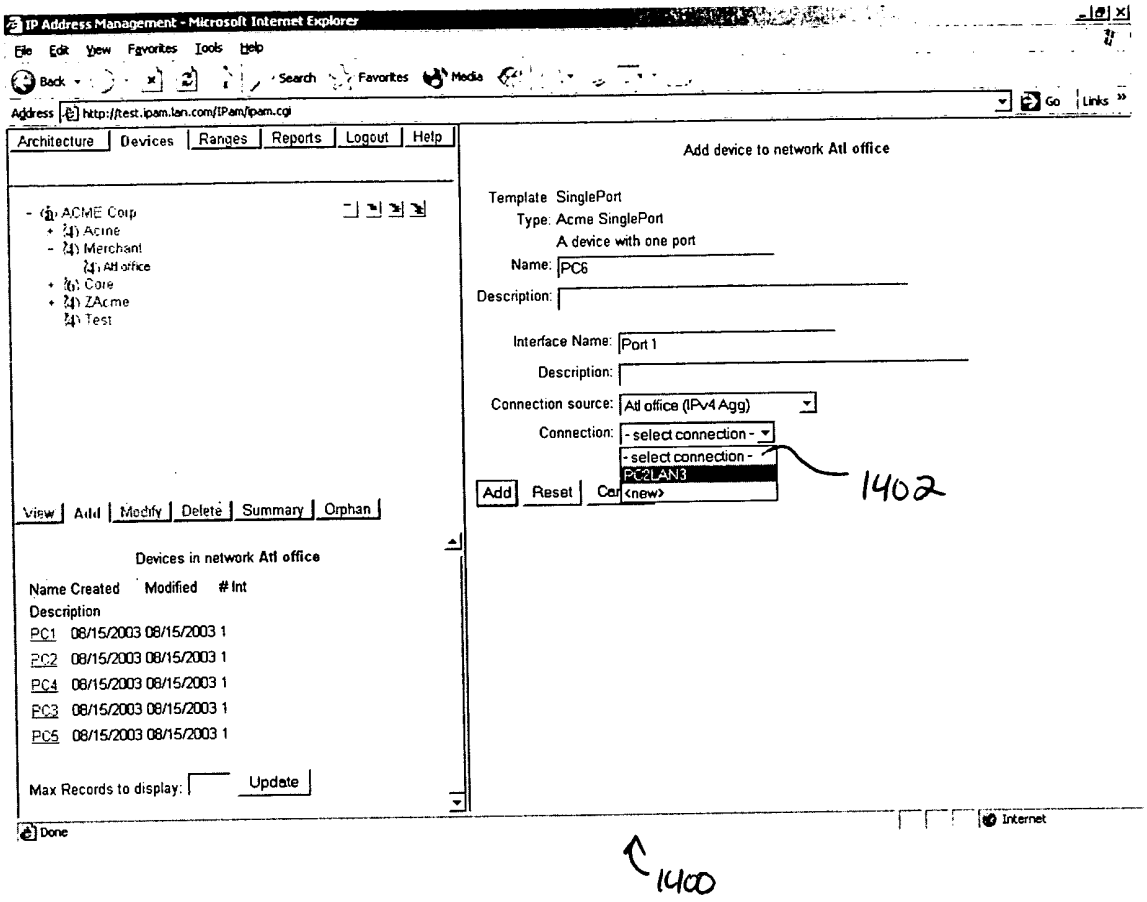

IP Address Management - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://test.ipam.lan.com/IPam/ipam.cgi
Go Links
Architecture Devices Ranges Reports Logout Help
ACME Corp
Acme
Merchant
Atl office
Core
ZAcme
Test
View Add Modify Delete Summary Orphan
Devices in network Atl office
Name Created Modified # Int
Description
PC1 08/15/2003 08/15/2003 1
PC2 08/15/2003 08/15/2003 1
PC4 08/15/2003 08/15/2003 1
PC3 08/15/2003 08/15/2003 1
PC5 08/15/2003 08/15/2003 1
Max Records to display: Update
Add device to network Atl office
Template SinglePort
Type: Acme SinglePort
A device with one port
Name: PC6
Description:
Interface Name: Port 1
Description:
Connection source: Atl office (IPv4 Agg)
Connection: - select connection -
- select connection -
PC2LAN3
<new>
Add Reset
1402
Done
Internet
1400

Fig 14

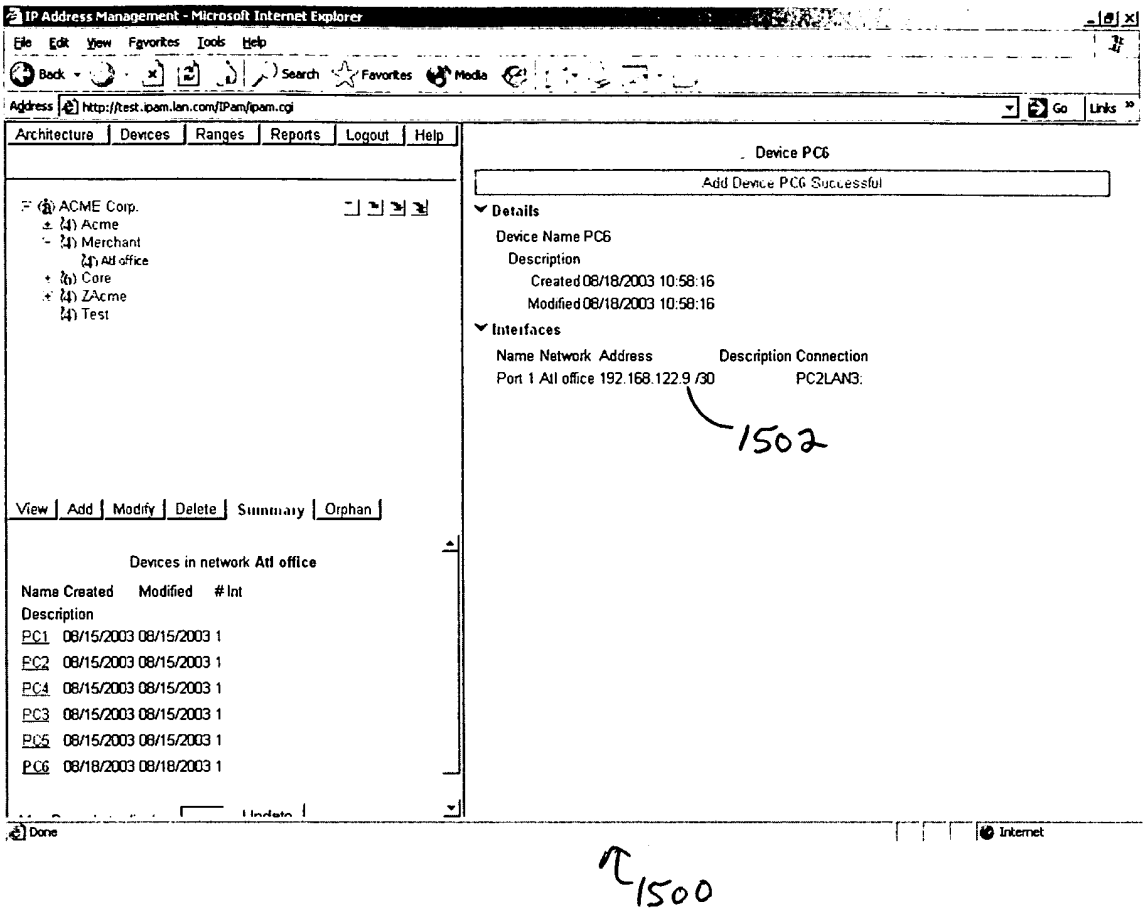

IP Address Management - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://test.ipam.lan.com/IPam/ipam.cgi
Go Links
Architecture Devices Ranges Reports Logout Help
ACME Corp.
Acme
Merchant
Atl office
Core
ZAcme
Test
Device PC6
Add Device PC6 Successful
Details
Device Name PC6
Description
Created 08/18/2003 10:58:16
Modified 08/18/2003 10:58:16
Interfaces
Name Network Address Description Connection
Port 1 Atl office 192.168.122.9 /30 PC2LAN3:
1502
View Add Modify Delete Summary Orphan
Devices in network Atl office
Name Created Modified # Int
Description
PC1 08/15/2003 08/15/2003 1
PC2 08/15/2003 08/15/2003 1
PC4 08/15/2003 08/15/2003 1
PC3 08/15/2003 08/15/2003 1
PC5 08/15/2003 08/15/2003 1
PC6 08/18/2003 08/18/2003 1
Done
Internet
1500

Fig 15

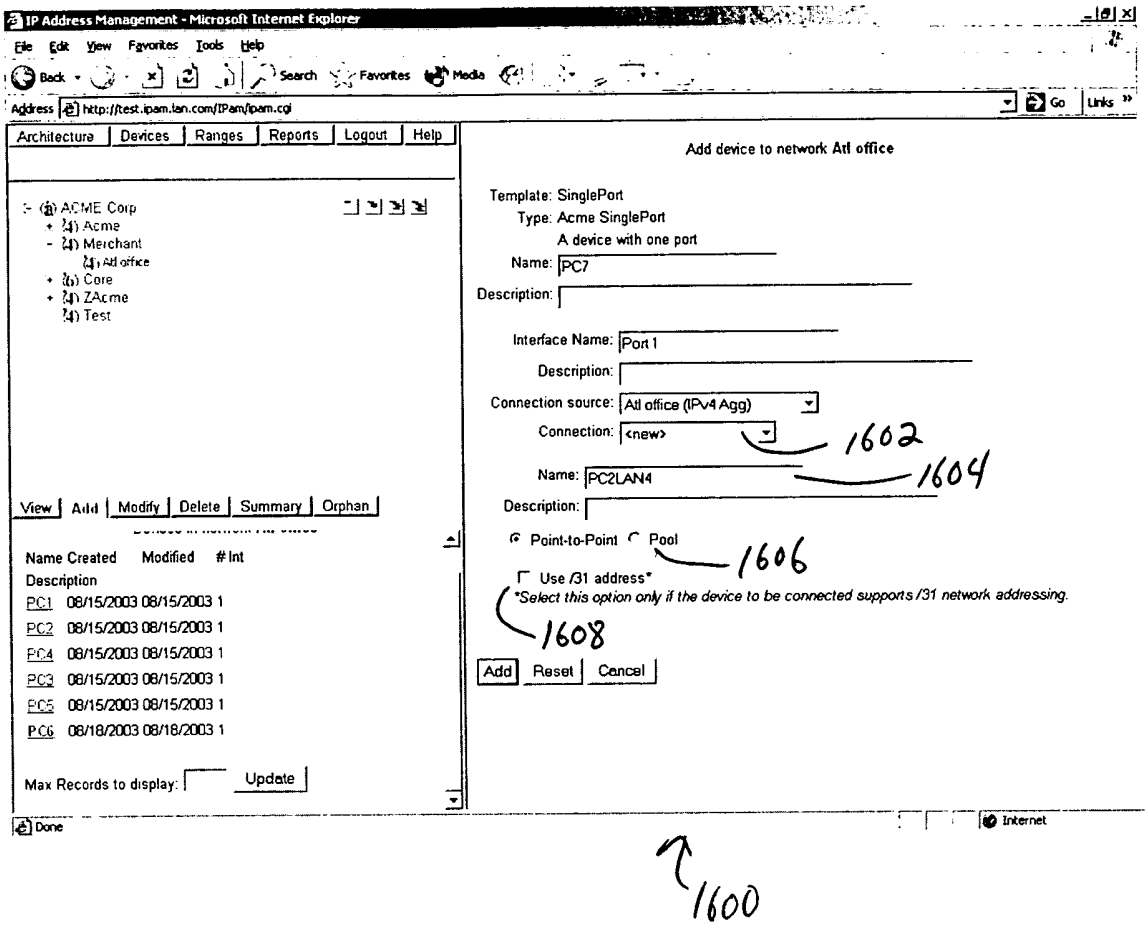

IP Address Management - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://test.ipam.lan.com/IPam/ipam.cgi
Go Links
Architecture Devices Ranges Reports Logout Help
ACME Corp
Acme
Merchant
Atl office
Core
ZAcme
Test
View Add Modify Delete Summary Orphan
Name Created Modified # Int
Description
PC1 08/15/2003 08/15/2003 1
PC2 08/15/2003 08/15/2003 1
PC4 08/15/2003 08/15/2003 1
PC3 08/15/2003 08/15/2003 1
PC5 08/15/2003 08/15/2003 1
PC6 08/18/2003 08/18/2003 1
Max Records to display: Update
Add device to network Atl office
Template: SinglePort
Type: Acme SinglePort
A device with one port
Name: PC7
Description:
Interface Name: Port 1
Description:
Connection source: Atl office (IPv4 Agg)
Connection: <new>
1602
Name: PC2LAN4
1604
Description:
Point-to-Point Pool
1606
Use /31 address*
*Select this option only if the device to be connected supports /31 network addressing.
1608
Add Reset Cancel
Done
Internet
1600

Fig 16

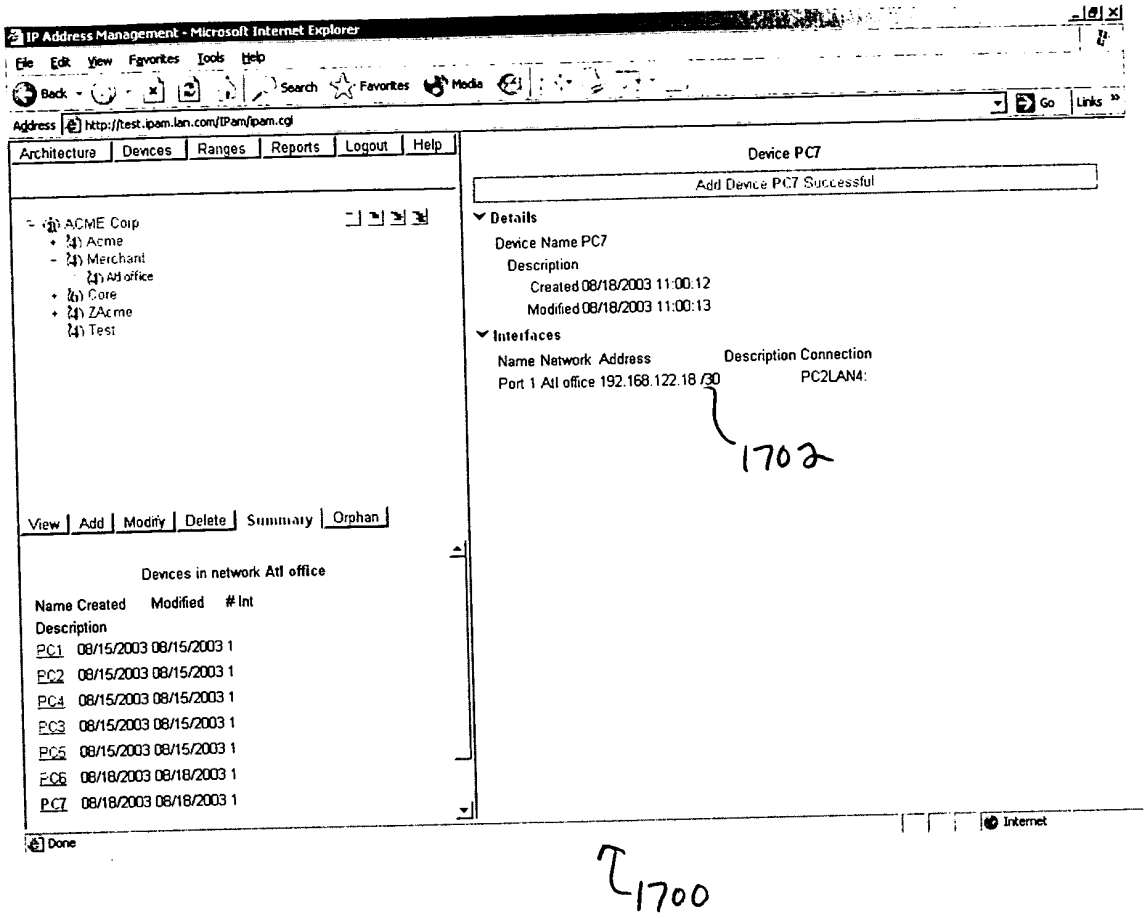

IP Address Management - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media Go Links
Address http://test.ipam.lan.com/IPam/ipam.cgi
Architecture Devices Ranges Reports Logout Help
ACME Corp
Acme
Merchant
Atl office
Core
ZAcme
Test
View Add Modify Delete Summary Orphan
Devices in network Atl office
Name Created Modified # Int
Description
PC1 08/15/2003 08/15/2003 1
PC2 08/15/2003 08/15/2003 1
PC4 08/15/2003 08/15/2003 1
PC3 08/15/2003 08/15/2003 1
PC5 08/15/2003 08/15/2003 1
PC6 08/18/2003 08/18/2003 1
PC7 08/18/2003 08/18/2003 1
Device PC7
Add Device PC7 Successful
Details
Device Name PC7
Description
Created 08/18/2003 11:00:12
Modified 08/18/2003 11:00:13
Interfaces
Name Network Address Description Connection
Port 1 Atl office 192.168.122.18 /30 PC2LAN4:
1702
Done
Internet
1700

Fig 17

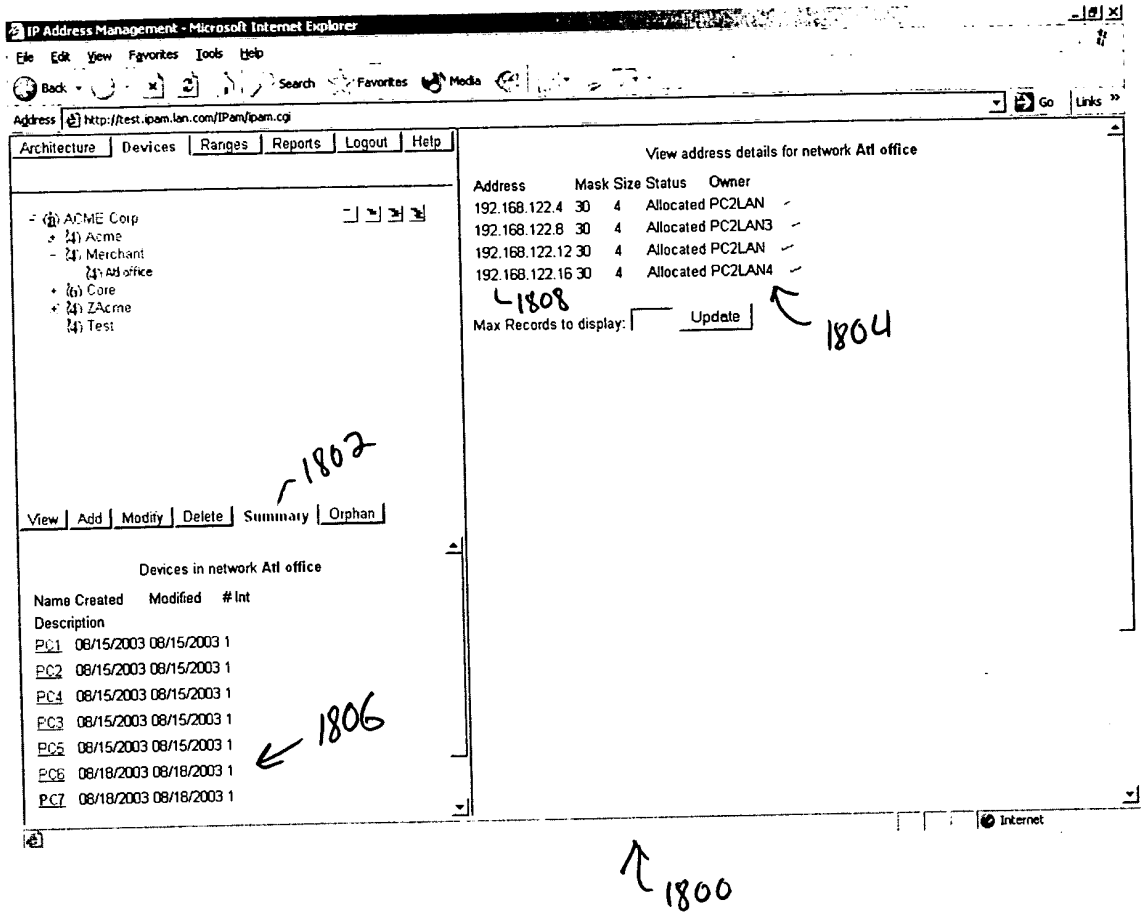

IP Address Management - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media Go Links
Address http://test.ipam.lan.com/IPam/ipam.cgi
Architecture Devices Ranges Reports Logout Help
ACME Corp
Acme
Merchant
Atl office
Core
ZAcme
Test
View address details for network Atl office
Address Mask Size Status Owner
192.168.122.4 30 4 Allocated PC2LAN
192.168.122.8 30 4 Allocated PC2LAN3
192.168.122.12 30 4 Allocated PC2LAN
192.168.122.16 30 4 Allocated PC2LAN4
1808
Max Records to display: Update
1804
1802
View Add Modify Delete Summary Orphan
Devices in network Atl office
Name Created Modified # Int
Description
PC1 08/15/2003 08/15/2003 1
PC2 08/15/2003 08/15/2003 1
PC4 08/15/2003 08/15/2003 1
PC3 08/15/2003 08/15/2003 1
PC5 08/15/2003 08/15/2003 1
PC6 08/18/2003 08/18/2003 1
PC7 08/18/2003 08/18/2003 1
1806
Internet
1800

Fig 18

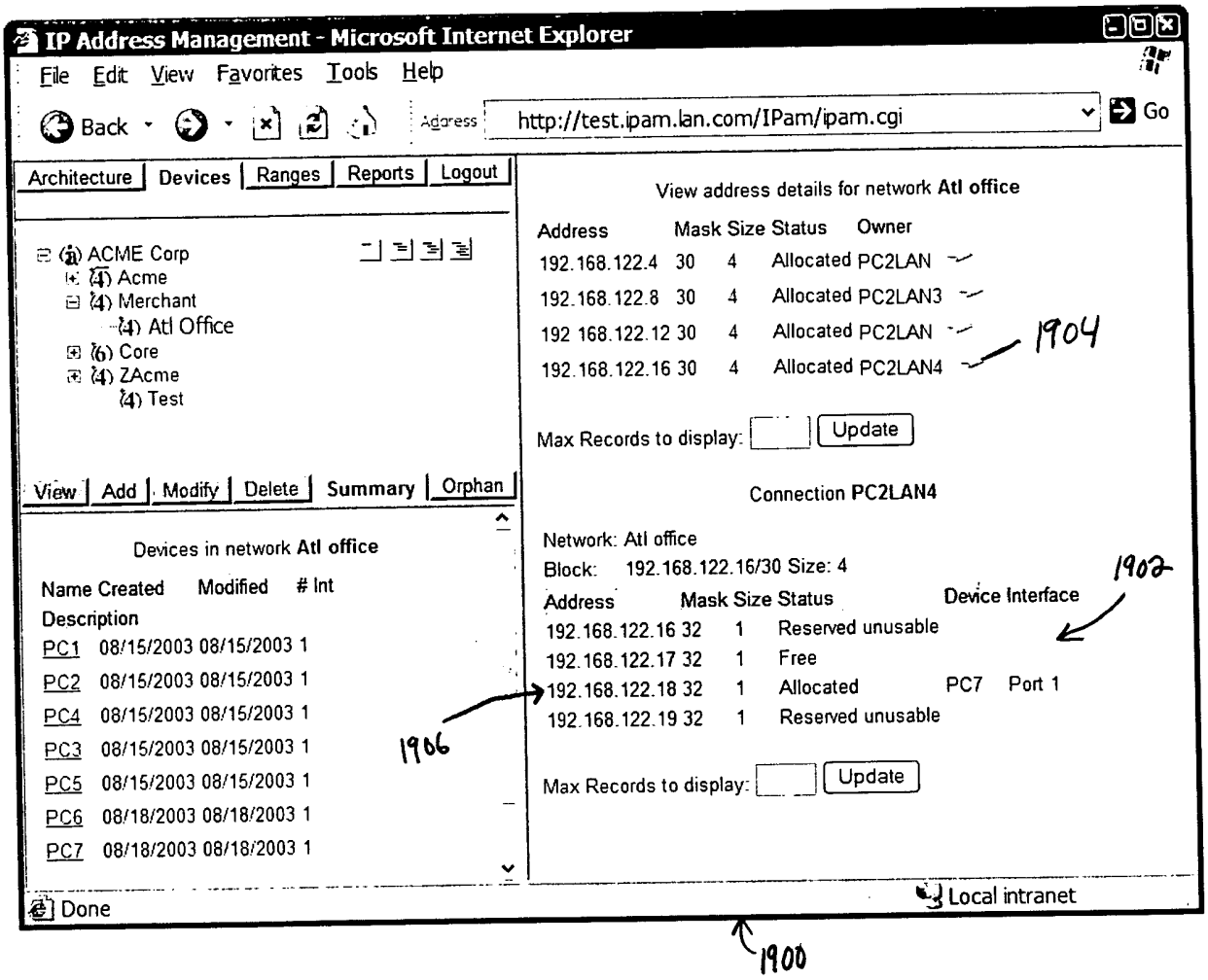

IP Address Management - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back
Address
http://test.ipam.lan.com/IPam/ipam.cgi
Go
Architecture
Devices
Ranges
Reports
Logout
ACME Corp
Acme
Merchant
Atl Office
Core
ZAcme
Test
View
Add
Modify
Delete
Summary
Orphan
Devices in network Atl office
Name Created Modified # Int
Description
PC1 08/15/2003 08/15/2003 1
PC2 08/15/2003 08/15/2003 1
PC4 08/15/2003 08/15/2003 1
PC3 08/15/2003 08/15/2003 1
PC5 08/15/2003 08/15/2003 1
PC6 08/18/2003 08/18/2003 1
PC7 08/18/2003 08/18/2003 1
1906
View address details for network Atl office
Address Mask Size Status Owner
192.168.122.4 30 4 Allocated PC2LAN
192.168.122.8 30 4 Allocated PC2LAN3
192 168.122.12 30 4 Allocated PC2LAN
192.168.122.16 30 4 Allocated PC2LAN4
1904
Max Records to display:
Update
Connection PC2LAN4
Network: Atl office
Block: 192.168.122.16/30 Size: 4
1902
Address Mask Size Status Device Interface
192.168.122.16 32 1 Reserved unusable
192.168.122.17 32 1 Free
192.168.122.18 32 1 Allocated PC7 Port 1
192.168.122.19 32 1 Reserved unusable
Max Records to display:
Update
Done
Local intranet
1900

Fig 19

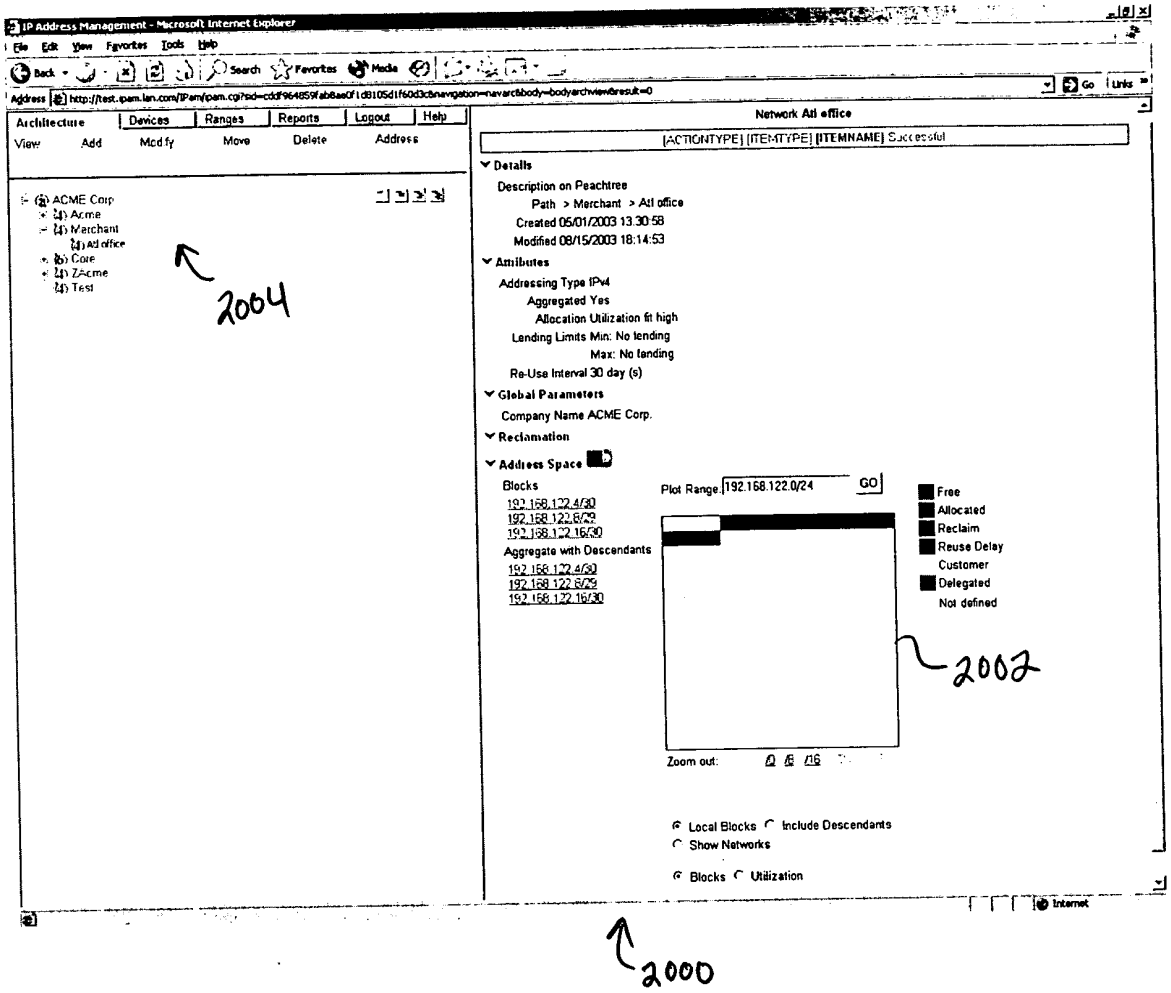

IP Address Management - Microsoft Internet Explorer
Architecture
Devices
Ranges
Reports
Logout
Help
View
Add
Modify
Move
Delete
Address
ACME Corp
Acme
Merchant
Atl office
Core
ZAcme
Test
2004
Network Atl office
[ACTIONTYPE] [ITEMTYPE] [ITEMNAME] Successful
Details
Description on Peachtree
Path > Merchant > Atl office
Created 05/01/2003 13:30:58
Modified 08/15/2003 18:14:53
Attributes
Addressing Type IPv4
Aggregated Yes
Allocation Utilization fit high
Lending Limits Min: No lending
Max: No lending
Re-Use Interval 30 day (s)
Global Parameters
Company Name ACME Corp.
Reclamation
Address Space
Blocks
192.168.122.4/30
192.168.122.8/29
192.168.122.16/30
Aggregate with Descendants
192.168.122.4/30
192.168.122.8/29
192.168.122.16/30
Plot Range 192.168.122.0/24
GO
Free
Allocated
Reclaim
Reuse Delay
Customer
Delegated
Not defined
2002
Zoom out:
Local Blocks
Include Descendants
Show Networks
Blocks
Utilization
Internet
2000

Fig 20

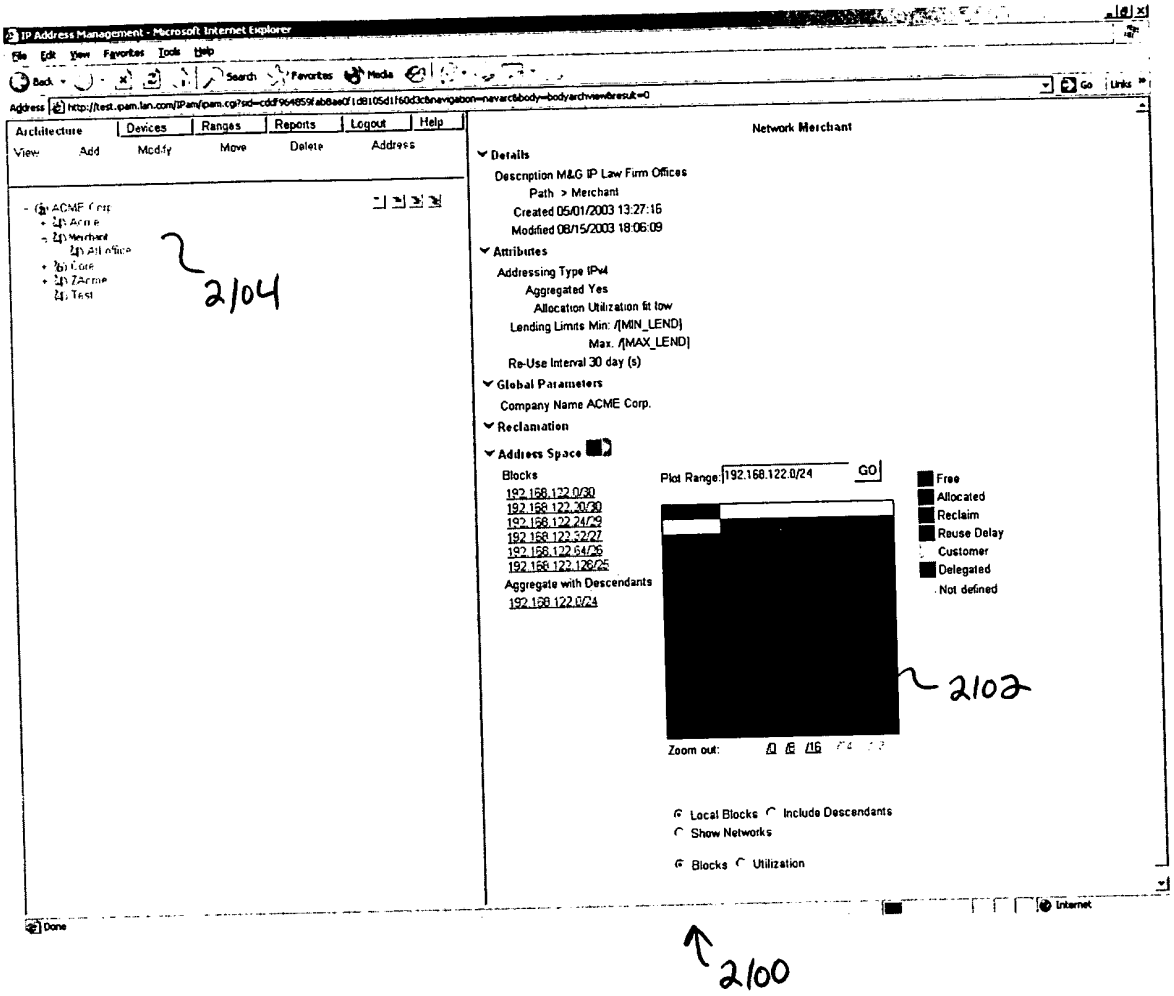

IP Address Management - Microsoft Internet Explorer
Architecture
Devices
Ranges
Reports
Logout
Help
View
Add
Modify
Move
Delete
Address
2104
Network Merchant
Details
Description M&G IP Law Firm Offices
Path > Merchant
Created 05/01/2003 13:27:15
Modified 08/15/2003 18:06:09
Attributes
Addressing Type IPv4
Aggregated Yes
Allocation Utilization fit low
Lending Limits Min: /[MIN_LEND]
Max. /[MAX_LEND]
Re-Use Interval 30 day (s)
Global Parameters
Company Name ACME Corp.
Reclamation
Address Space
Blocks
192.168.122.0/30
192.168.122.20/30
192.168.122.24/29
192.168.122.32/27
192.168.122.64/26
192.168.122.128/25
Aggregate with Descendants
192.168.122.0/24
Plot Range: 192.168.122.0/24
GO
Free
Allocated
Reclaim
Reuse Delay
Customer
Delegated
Not defined
2102
Zoom out:
Local Blocks
Include Descendants
Show Networks
Blocks
Utilization
Done
Internet
2100

Fig 21

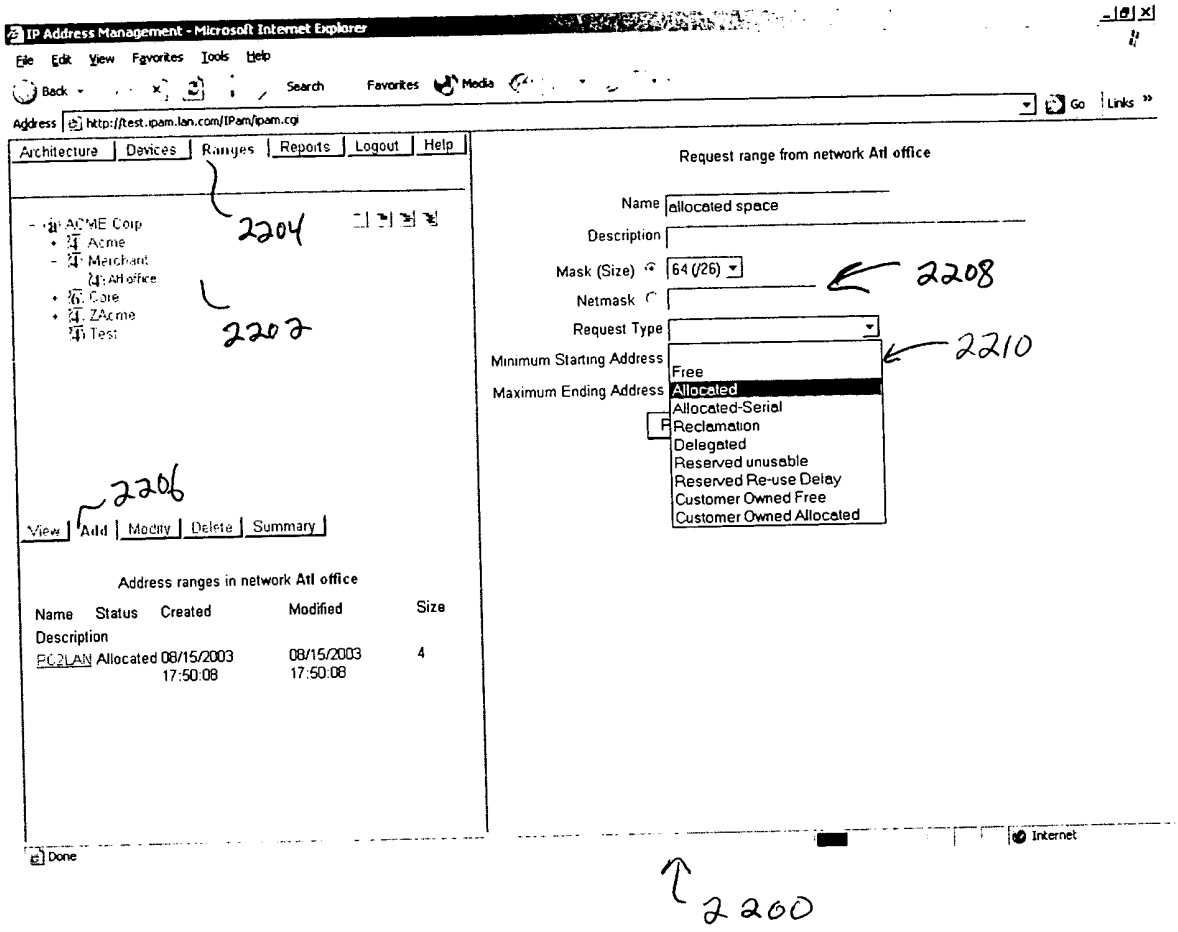

IP Address Management - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media Go Links
Address http://test.ipam.lan.com/IPam/ipam.cgi
Architecture Devices Ranges Reports Logout Help
2204
ACME Corp
Acme
Merchant
ATLoffice
Core
ZAcme
Test
2202
2206
View Add Modify Delete Summary
Address ranges in network Atl office
Name Status Created Modified Size
Description
PC2LAN Allocated 08/15/2003 17:50:08 08/15/2003 17:50:08 4
Request range from network Atl office
Name allocated space
Description
Mask (Size) 64 (/26)
2208
Netmask
Request Type
2210
Minimum Starting Address
Maximum Ending Address
Free
Allocated
Allocated-Serial
Reclamation
Delegated
Reserved unusable
Reserved Re-use Delay
Customer Owned Free
Customer Owned Allocated
Done
Internet
2200

Fig 22

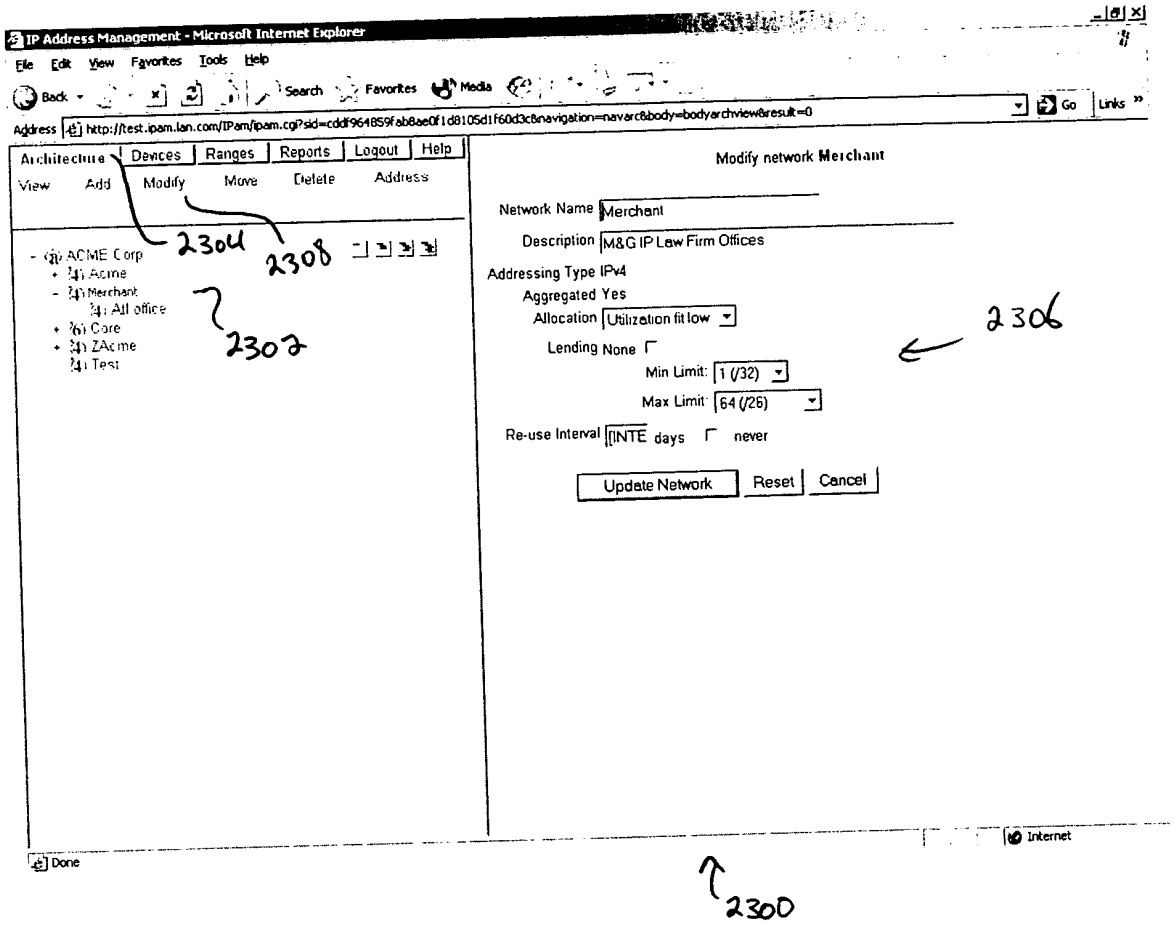

IP Address Management - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://test.ipam.lan.com/IPam/ipam.cgi?sid=cddf9648S9fab8ae0f1d8105d1f60d3c8navigation=navarc&body=bodyarchview&result=0
Go Links
Architecture Devices Ranges Reports Logout Help
View Add Modify Move Delete Address
ACME Corp
Acme
Merchant
All office
Core
ZAcme
Test
2304
2308
2307
Modify network Merchant
Network Name Merchant
Description M&G IP Law Firm Offices
Addressing Type IPv4
Aggregated Yes
Allocation Utilization fit low
Lending None
Min Limit: 1 (/32)
Max Limit: 64 (/26)
Re-use Interval INTE days never
Update Network Reset Cancel
2306
Done
Internet
2300

Fig 23

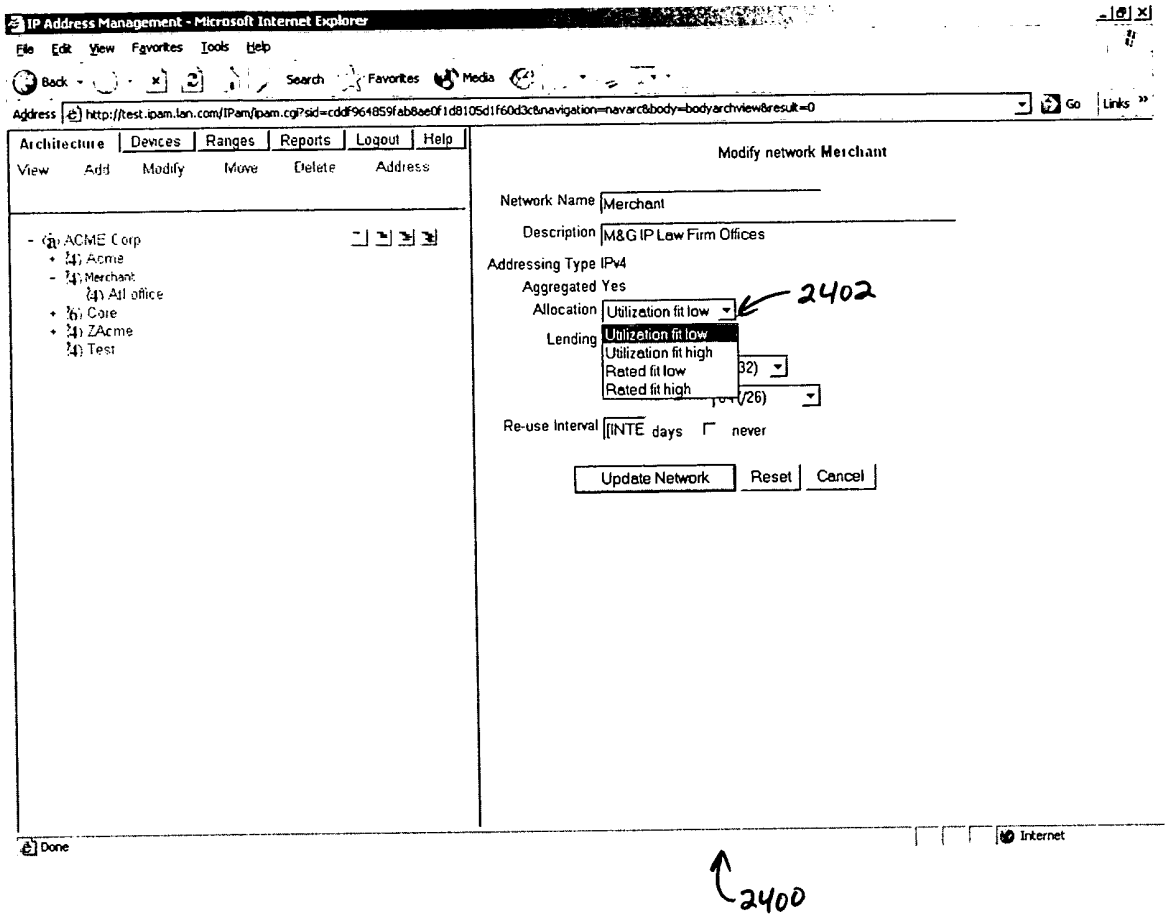

IP Address Management - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://test.ipam.lan.com/IPam/ipam.cgi?sid=cddf964859fab8ae0f1d8105d1f60d3c&navigation=navarc&body=bodyarchview&result=0
Go Links
Architecture Devices Ranges Reports Logout Help
View Add Modify Move Delete Address
ACME Corp
Acme
Merchant
All office
Core
ZAcme
Test
Modify network Merchant
Network Name Merchant
Description M&G IP Law Firm Offices
Addressing Type IPv4
Aggregated Yes
Allocation Utilization fit low
Utilization fit low
Utilization fit high
Rated fit low
Rated fit high
2402
Lending
Re-use Interval INTE days never
Update Network Reset Cancel
Done
Internet
2400

Fig 24

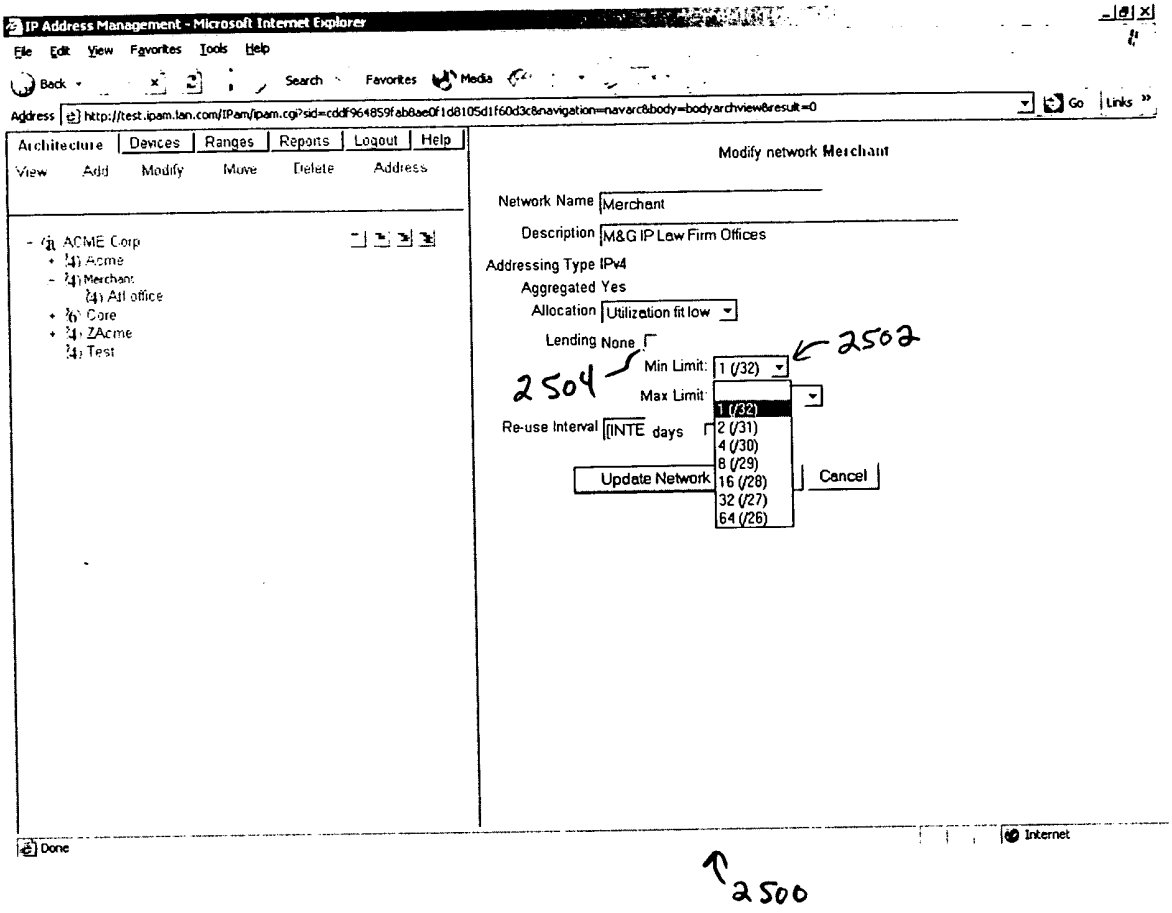

IP Address Management - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://test.ipam.lan.com/IPam/ipam.cgi?sid=cddf964859fab8ae0f1d8105d1f60d3c8navigation=navarc&body=bodyarchview&result=0
Go Links
Architecture Devices Ranges Reports Logout Help
View Add Modify Move Delete Address
ACME Corp
Acme
Merchant
All office
Core
ZAcme
Test
Modify network Merchant
Network Name Merchant
Description M&G IP Law Firm Offices
Addressing Type IPv4
Aggregated Yes
Allocation Utilization fit low
Lending None
Min Limit: 1 (/32)
Max Limit:
1 (/32)
2 (/31)
4 (/30)
8 (/29)
16 (/28)
32 (/27)
64 (/26)
Re-use Interval [INTE days
Update Network
Cancel
2502
2504
2500
Done
Internet

Fig 25

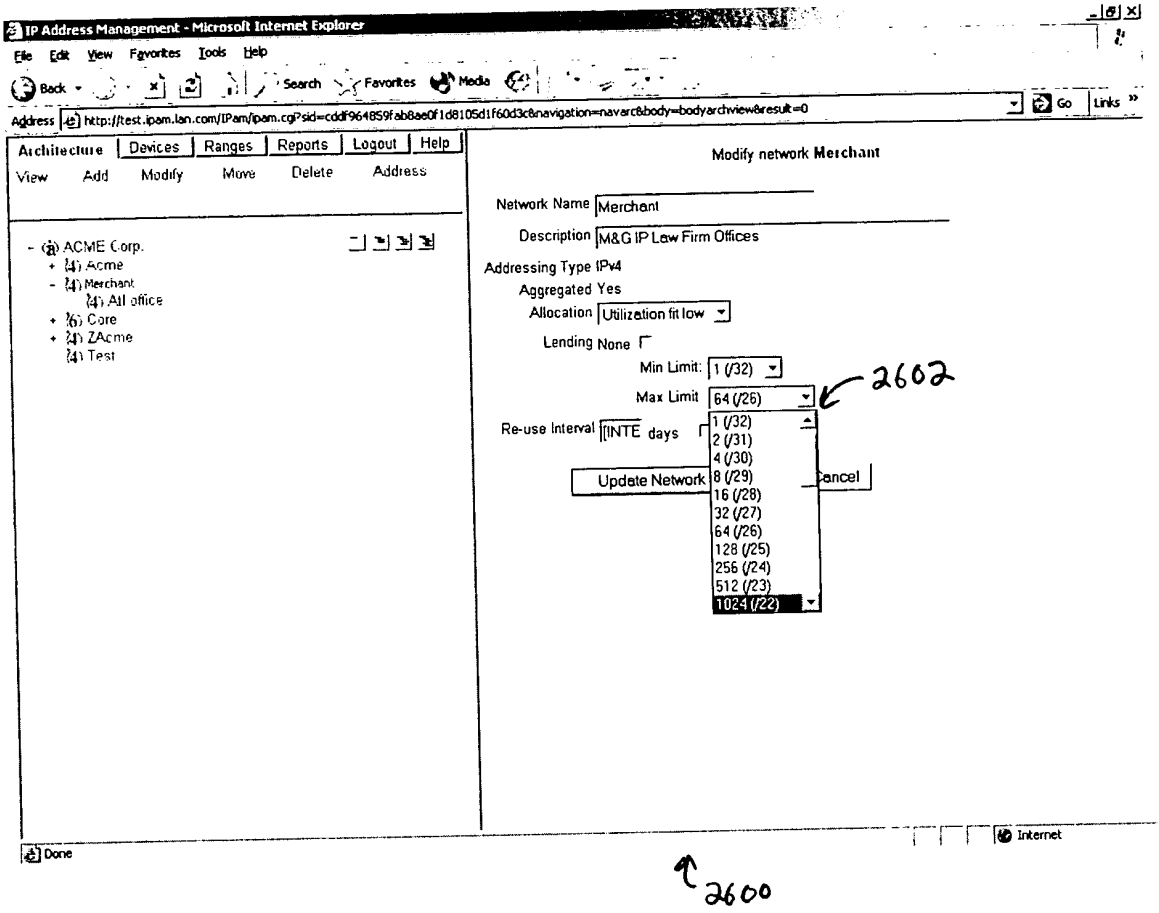

IP Address Management - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://test.ipam.lan.com/IPam/ipam.cgi?sid=cddf9648591ab8ae0f1d8105d1f60d3c&navigation=navarc&body=bodyarchview&result=0
Go Links
Architecture Devices Ranges Reports Logout Help
View Add Modify Move Delete Address
ACME Corp.
Acme
Merchant
All office
Core
ZAcme
Test
Modify network Merchant
Network Name Merchant
Description M&G IP Law Firm Offices
Addressing Type IPv4
Aggregated Yes
Allocation Utilization fit low
Lending None
Min Limit: 1 (/32)
Max Limit 64 (/26)
2602
Re-use Interval [INTE days
1 (/32)
2 (/31)
4 (/30)
8 (/29)
16 (/28)
32 (/27)
64 (/26)
128 (/25)
256 (/24)
512 (/23)
1024 (/22)
Update Network
Cancel
Done
Internet
2600

Fig 26

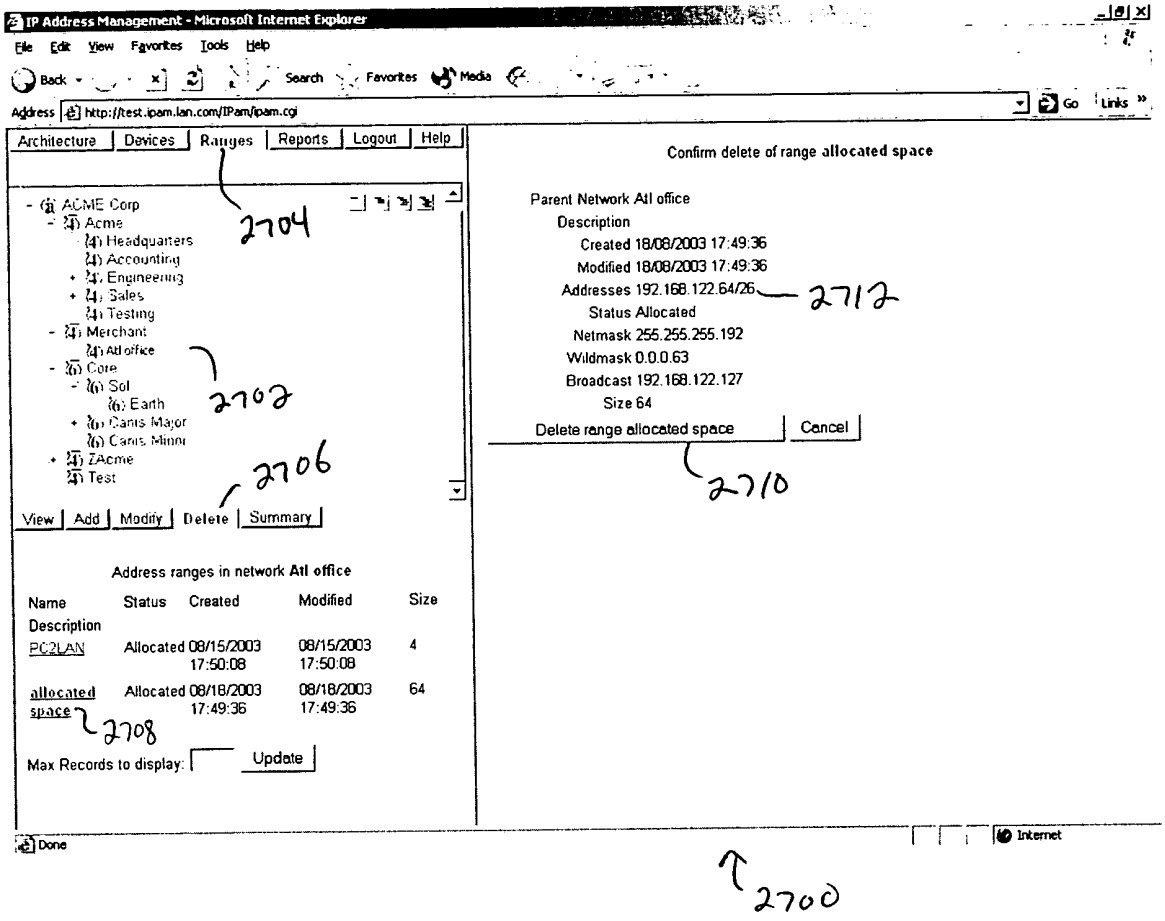

IP Address Management - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://test.ipam.lan.com/IPam/ipam.cgi
Go Links
Architecture Devices Ranges Reports Logout Help
2704
ACME Corp
Acme
Headquarters
Accounting
Engineering
Sales
Testing
Merchant
Atl office
Core
Sol
Earth
Canis Major
Canis Minor
ZAcme
Test
2702
2706
View Add Modify Delete Summary
Address ranges in network Atl office
Name Status Created Modified Size
Description
PC2LAN Allocated 08/15/2003 17:50:08 08/15/2003 17:50:08 4
allocated space Allocated 08/18/2003 17:49:36 08/18/2003 17:49:36 64
2708
Max Records to display: Update
Confirm delete of range allocated space
Parent Network Atl office
Description
Created 18/08/2003 17:49:36
Modified 18/08/2003 17:49:36
Addresses 192.168.122.64/26
Status Allocated
Netmask 255.255.255.192
Wildmask 0.0.0.63
Broadcast 192.168.122.127
Size 64
2712
Delete range allocated space Cancel
2710
Done
Internet
2700

Fig 27

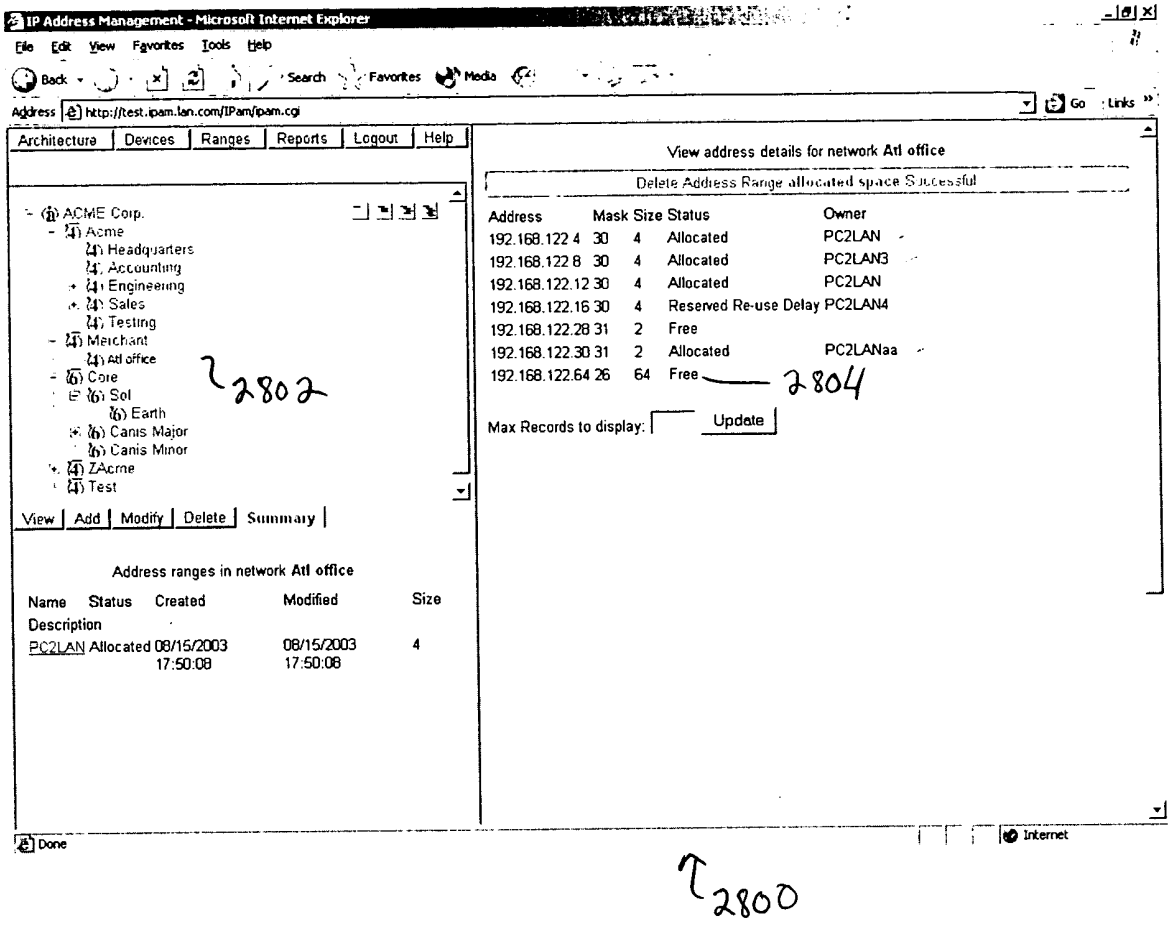

IP Address Management - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://test.ipam.lan.com/IPam/ipam.cgi
Go Links
Architecture Devices Ranges Reports Logout Help
ACME Corp.
Acme
Headquarters
Accounting
Engineering
Sales
Testing
Merchant
Atl office
Core
Sol
Earth
Canis Major
Canis Minor
ZAcme
Test
2802
View Add Modify Delete Summary
Address ranges in network Atl office
Name Status Created Modified Size
Description
PC2LAN Allocated 08/15/2003 17:50:08 08/15/2003 17:50:08 4
View address details for network Atl office
Delete Address Range allocated space Successful
Address Mask Size Status Owner
192.168.122.4 30 4 Allocated PC2LAN
192.168.122.8 30 4 Allocated PC2LAN3
192.168.122.12 30 4 Allocated PC2LAN
192.168.122.16 30 4 Reserved Re-use Delay PC2LAN4
192.168.122.28 31 2 Free
192.168.122.30 31 2 Allocated PC2LANaa
192.168.122.64 26 64 Free
2804
Max Records to display: Update
Done
Internet
2800

Fig 28

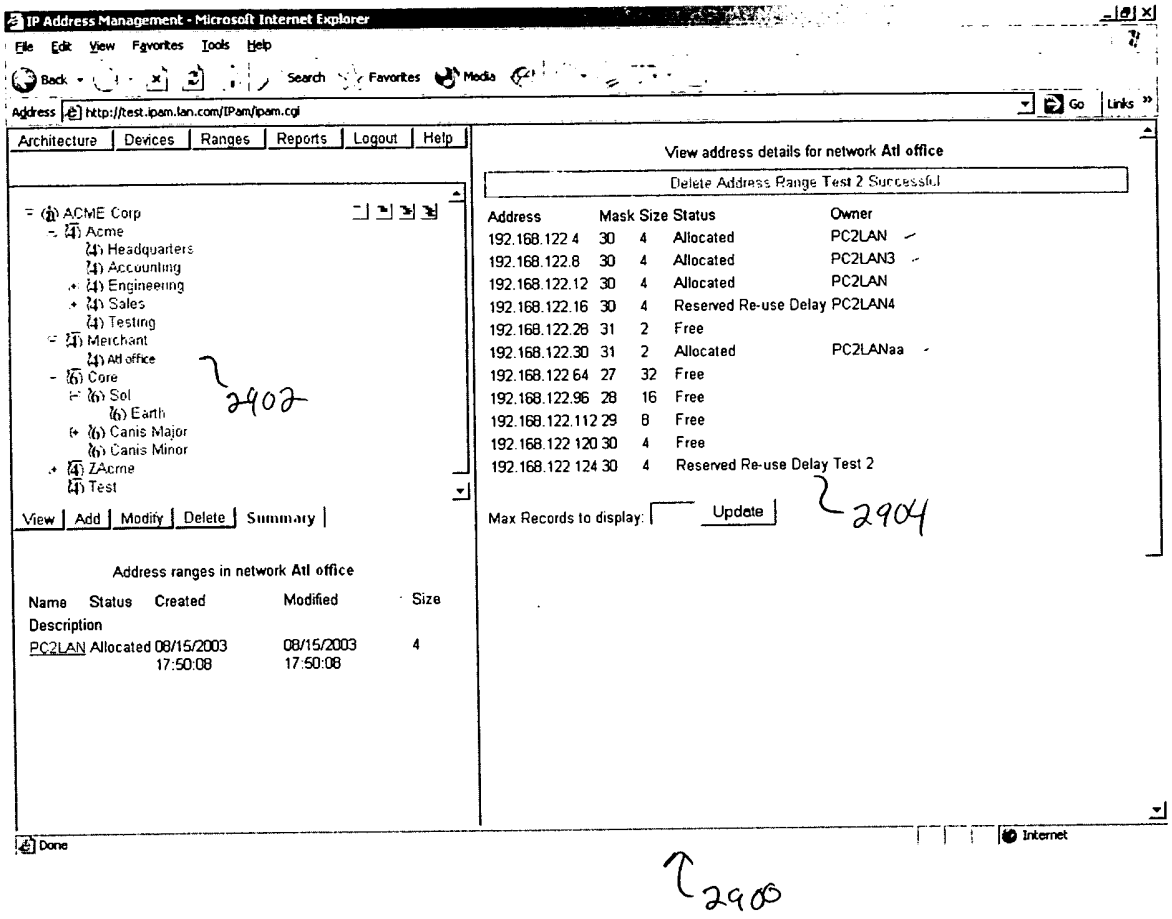

IP Address Management - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://test.ipam.lan.com/IPam/ipam.cgi
Go Links
Architecture Devices Ranges Reports Logout Help
ACME Corp
Acme
Headquarters
Accounting
Engineering
Sales
Testing
Merchant
Atl office
Core
Sol
Earth
Canis Major
Canis Minor
ZAcme
Test
2902
View Add Modify Delete Summary
Address ranges in network Atl office
Name Status Created Modified Size
Description
PC2LAN Allocated 08/15/2003 17:50:08 08/15/2003 17:50:08 4
View address details for network Atl office
Delete Address Range Test 2 Success(d
Address Mask Size Status Owner
192.168.122.4 30 4 Allocated PC2LAN
192.168.122.8 30 4 Allocated PC2LAN3
192.168.122.12 30 4 Allocated PC2LAN
192.168.122.16 30 4 Reserved Re-use Delay PC2LAN4
192.168.122.28 31 2 Free
192.168.122.30 31 2 Allocated PC2LANaa
192.168.122.64 27 32 Free
192.168.122.96 28 16 Free
192.168.122.112 29 8 Free
192.168.122.120 30 4 Free
192.168.122.124 30 4 Reserved Re-use Delay Test 2
Max Records to display: Update
2904
Done
Internet
2900

Fig 29

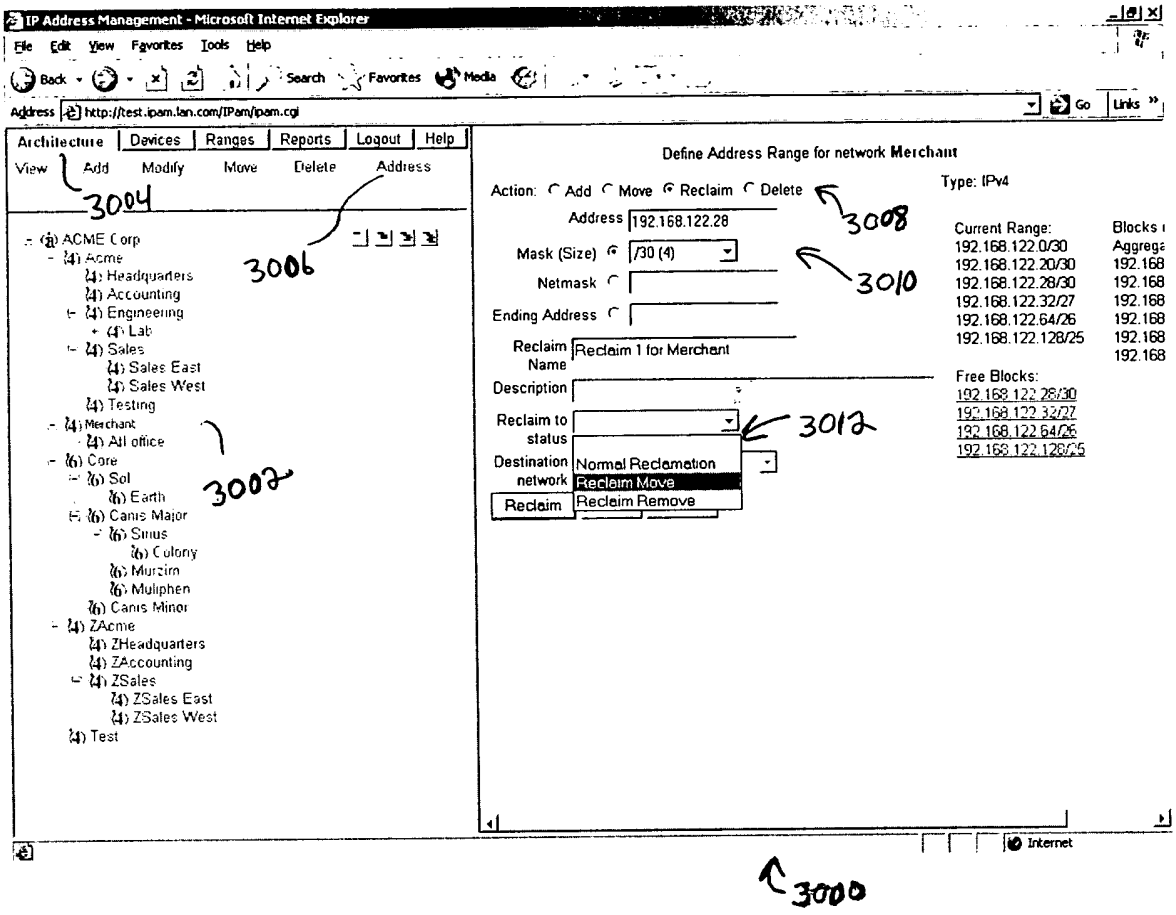

IP Address Management - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://test.ipam.lan.com/IPam/ipam.cgi
Go Links
Architecture Devices Ranges Reports Logout Help
View Add Modify Move Delete Address
3004
3006
ACME Corp
Acme
Headquarters
Accounting
Engineering
Lab
Sales
Sales East
Sales West
Testing
Merchant
All office
Core
Sol
Earth
Canis Major
Sirius
Colony
Murzim
Muliphen
Canis Minor
ZAcme
ZHeadquarters
ZAccounting
ZSales
ZSales East
ZSales West
Test
3002
Define Address Range for network Merchant
Action: Add Move Reclaim Delete
3008
Type: IPv4
Address 192.168.122.28
Mask (Size) /30 (4)
3010
Netmask
Ending Address
Reclaim Name Reclaim 1 for Merchant
Description
Reclaim to status
3012
Destination network
Normal Reclamation
Reclaim Move
Reclaim Remove
Reclaim
Current Range:
192.168.122.0/30
192.168.122.20/30
192.168.122.28/30
192.168.122.32/27
192.168.122.64/26
192.168.122.128/25
Blocks
Aggrega
192.168
192.168
192.168
192.168
192.168
Free Blocks:
192.168.122.28/30
192.168.122.32/27
192.168.122.64/26
192.168.122.128/25
Internet
3000

Fig 30

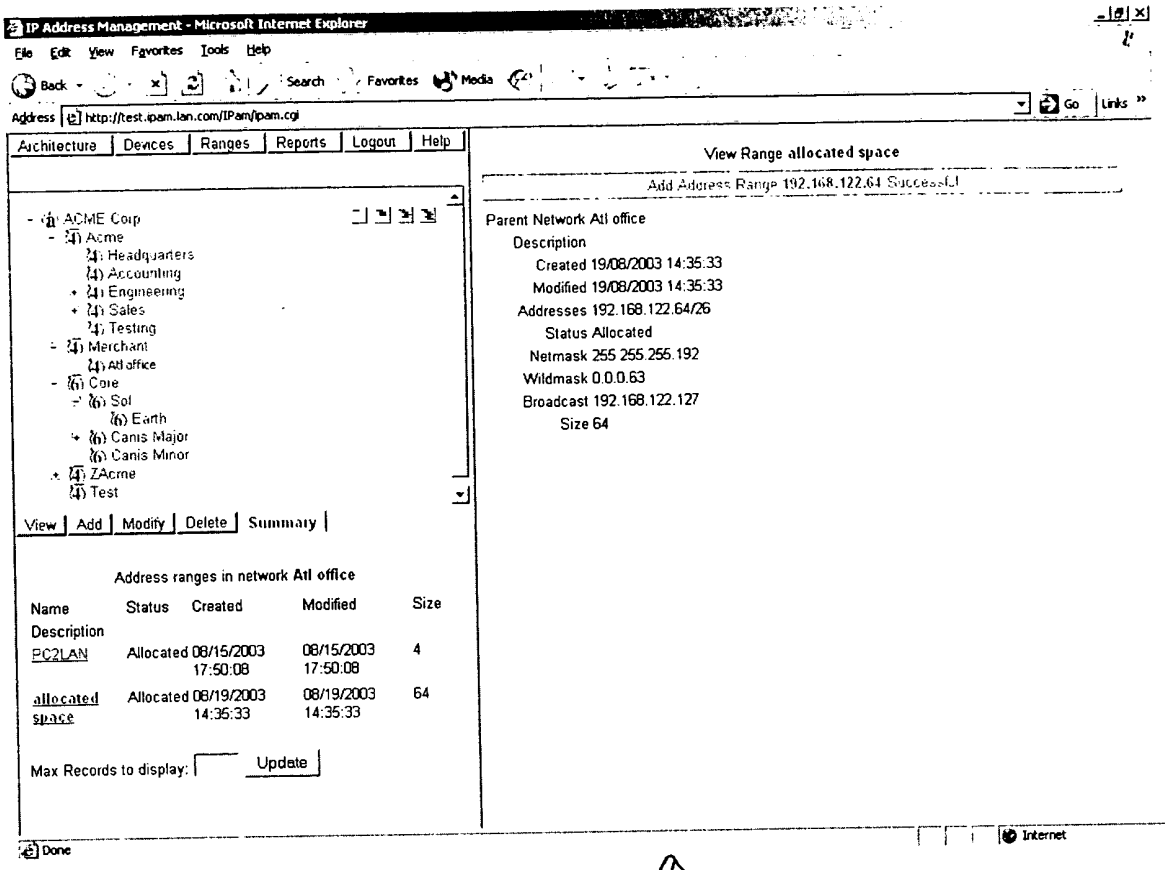

IP Address Management - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://test.ipam.lan.com/IPam/ipam.cgi
Go Links
Architecture Devices Ranges Reports Logout Help
ACME Corp
Acme
Headquarters
Accounting
Engineering
Sales
Testing
Merchant
Atl office
Core
Sol
Earth
Canis Major
Canis Minor
ZAcme
Test
View Add Modify Delete Summary
Address ranges in network Atl office
Name Status Created Modified Size
Description
PC2LAN Allocated 08/15/2003 17:50:08 08/15/2003 17:50:08 4
allocated space Allocated 08/19/2003 14:35:33 08/19/2003 14:35:33 64
Max Records to display: Update
View Range allocated space
Add Address Range 192.168.122.64 Successful
Parent Network Atl office
Description
Created 19/08/2003 14:35:33
Modified 19/08/2003 14:35:33
Addresses 192.168.122.64/26
Status Allocated
Netmask 255 255.255.192
Wildmask 0.0.0.63
Broadcast 192.168.122.127
Size 64
Done
Internet
3100

Fig 31

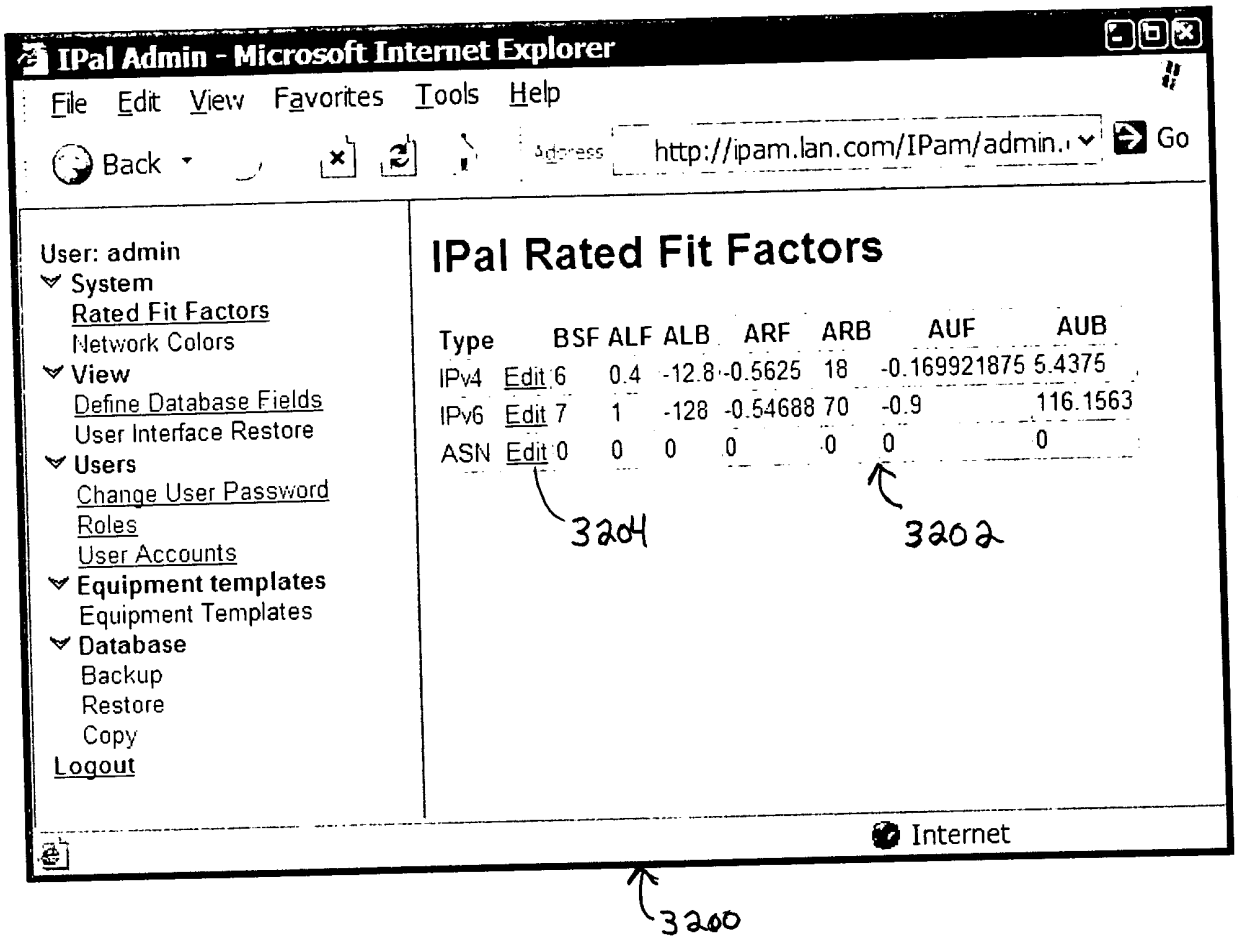

IPal Admin - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back
Address
http://ipam.lan.com/IPam/admin.
Go
User: admin
System
Rated Fit Factors
Network Colors
View
Define Database Fields
User Interface Restore
Users
Change User Password
Roles
User Accounts
Equipment templates
Equipment Templates
Database
Backup
Restore
Copy
Logout
IPal Rated Fit Factors
Type BSF ALF ALB ARF ARB AUF AUB
IPv4 Edit 6 0.4 -12.8 -0.5625 18 -0.169921875 5.4375
IPv6 Edit 7 1 -128 -0.54688 70 -0.9 116.1563
ASN Edit 0 0 0 0 0 0 0
3204
3202
Internet
3200

Fig 32

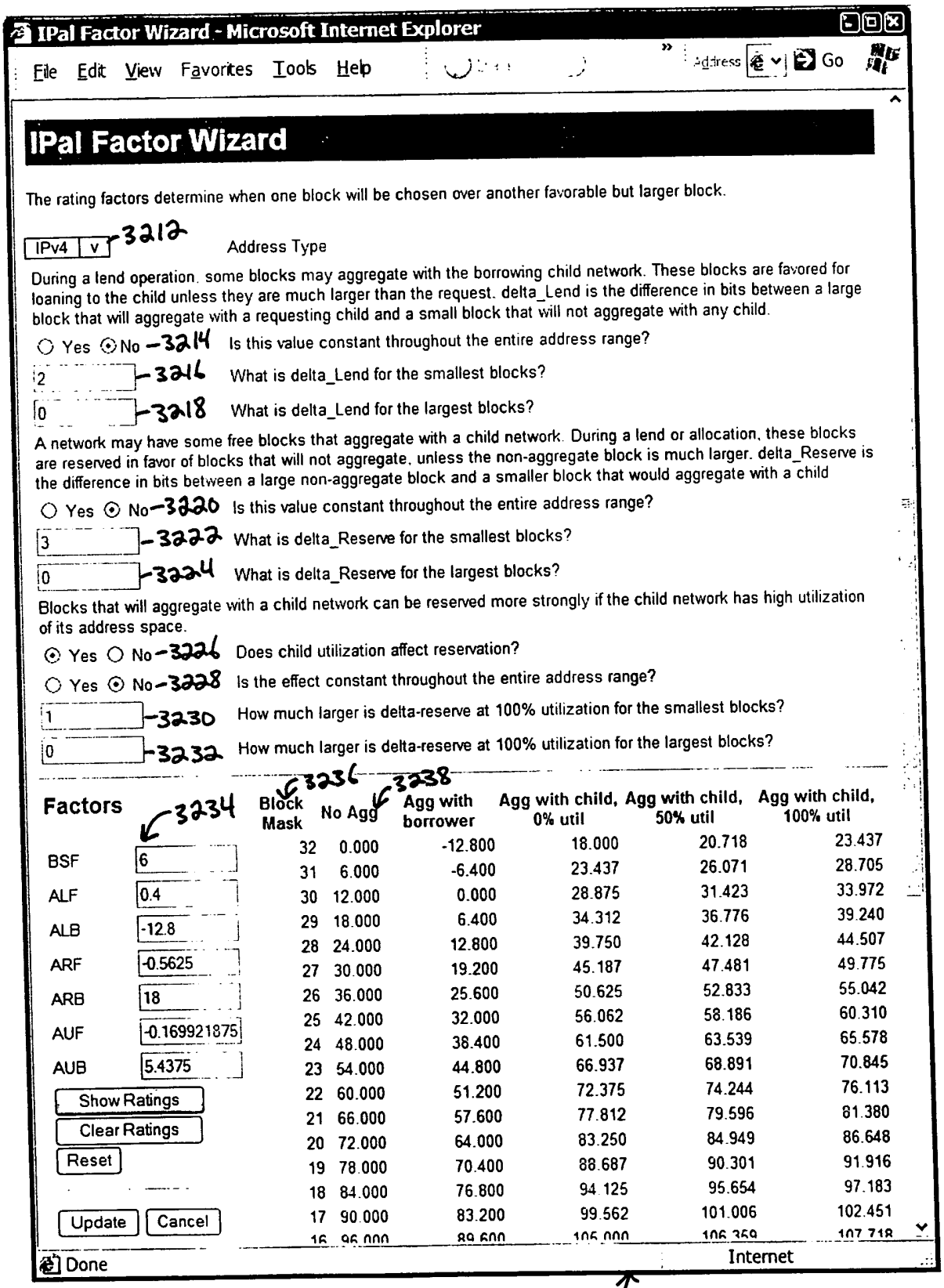

IPal Factor Wizard - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address Go
IPal Factor Wizard
The rating factors determine when one block will be chosen over another favorable but larger block.
IPv4
3212
Address Type
During a lend operation, some blocks may aggregate with the borrowing child network. These blocks are favored for loaning to the child unless they are much larger than the request. delta_Lend is the difference in bits between a large block that will aggregate with a requesting child and a small block that will not aggregate with any child.
Yes No 3214 Is this value constant throughout the entire address range?
2 3216 What is delta_Lend for the smallest blocks?
0 3218 What is delta_Lend for the largest blocks?
A network may have some free blocks that aggregate with a child network. During a lend or allocation, these blocks are reserved in favor of blocks that will not aggregate, unless the non-aggregate block is much larger. delta_Reserve is the difference in bits between a large non-aggregate block and a smaller block that would aggregate with a child
Yes No 3220 Is this value constant throughout the entire address range?
3 3222 What is delta_Reserve for the smallest blocks?
0 3224 What is delta_Reserve for the largest blocks?
Blocks that will aggregate with a child network can be reserved more strongly if the child network has high utilization of its address space.
Yes No 3226 Does child utilization affect reservation?
Yes No 3228 Is the effect constant throughout the entire address range?
1 3230 How much larger is delta-reserve at 100% utilization for the smallest blocks?
0 3232 How much larger is delta-reserve at 100% utilization for the largest blocks?
Factors
3234
BSF 6
ALF 0.4
ALB -12.8
ARF -0.5625
ARB 18
AUF -0.169921875
AUB 5.4375
Show Ratings
Clear Ratings
Reset
Update Cancel
3236
3238
Block Mask | No Agg | Agg with borrower | Agg with child, 0% util | Agg with child, 50% util | Agg with child, 100% util
32 0.000 -12.800 18.000 20.718 23.437
31 6.000 -6.400 23.437 26.071 28.705
30 12.000 0.000 28.875 31.423 33.972
29 18.000 6.400 34.312 36.776 39.240
28 24.000 12.800 39.750 42.128 44.507
27 30.000 19.200 45.187 47.481 49.775
26 36.000 25.600 50.625 52.833 55.042
25 42.000 32.000 56.062 58.186 60.310
24 48.000 38.400 61.500 63.539 65.578
23 54.000 44.800 66.937 68.891 70.845
22 60.000 51.200 72.375 74.244 76.113
21 66.000 57.600 77.812 79.596 81.380
20 72.000 64.000 83.250 84.949 86.648
19 78.000 70.400 88.687 90.301 91.916
18 84.000 76.800 94.125 95.654 97.183
17 90.000 83.200 99.562 101.006 102.451
16 96.000 89.600 105.000 106.359 107.718
Done
Internet
3210

Fig 32A

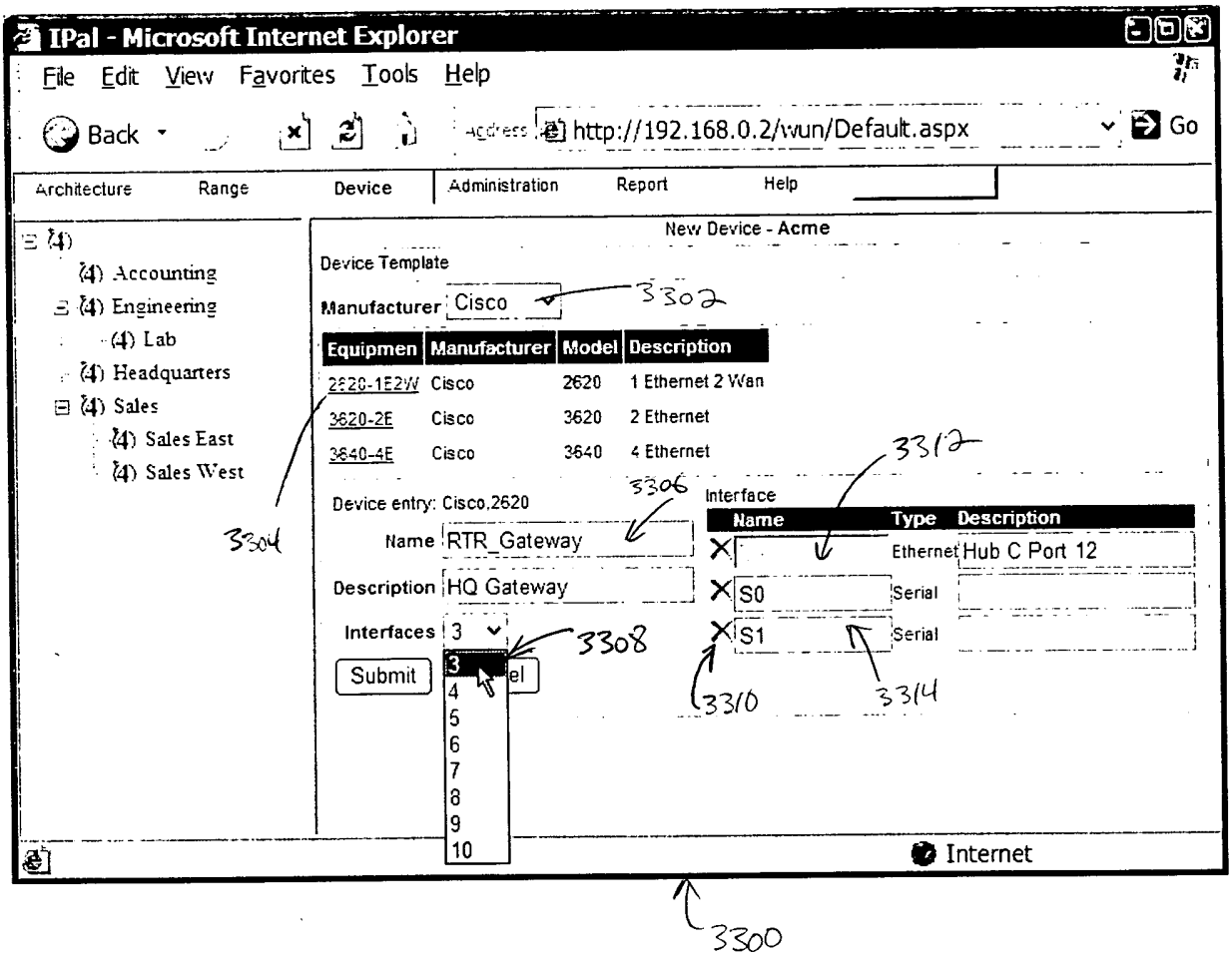

IPal - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back
http://192.168.0.2/wun/Default.aspx
Go
Architecture
Range
Device
Administration
Report
Help
(4)
(4) Accounting
(4) Engineering
(4) Lab
(4) Headquarters
(4) Sales
(4) Sales East
(4) Sales West
New Device - Acme
Device Template
Manufacturer Cisco
3302
Equipmen
Manufacturer
Model
Description
2620-1E2W Cisco 2620 1 Ethernet 2 Wan
3620-2E Cisco 3620 2 Ethernet
3640-4E Cisco 3640 4 Ethernet
3304
Device entry: Cisco.2620
3306
Name RTR_Gateway
Description HQ Gateway
Interfaces 3
3308
Submit
3
4
5
6
7
8
9
10
Interface
Name
Type
Description
3312
Ethernet Hub C Port 12
S0 Serial
S1 Serial
3310
3314
Internet
3300

Fig 33

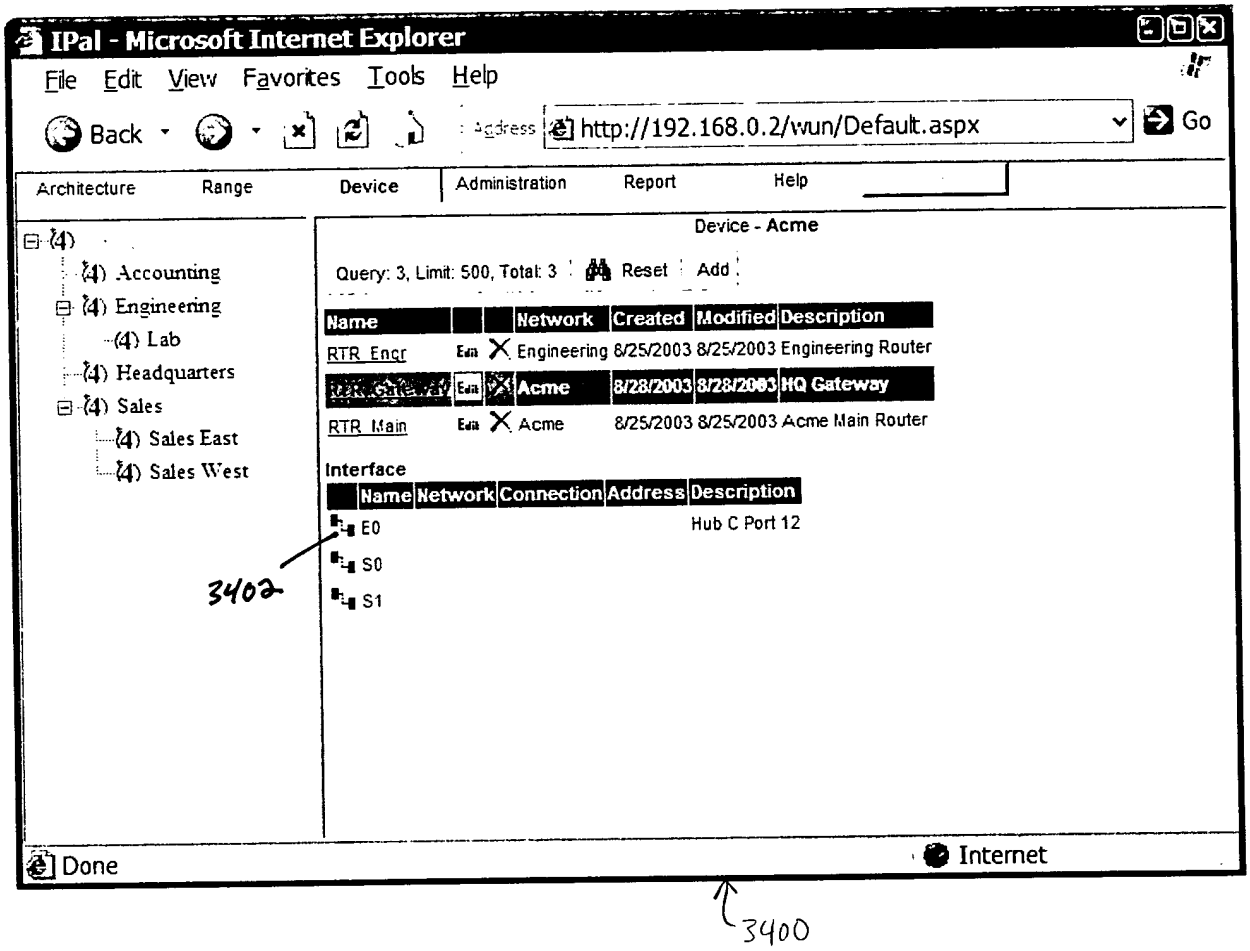

IPal - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back
Address
http://192.168.0.2/wun/Default.aspx
Go
Architecture
Range
Device
Administration
Report
Help
(4)
(4) Accounting
(4) Engineering
(4) Lab
(4) Headquarters
(4) Sales
(4) Sales East
(4) Sales West
Device - Acme
Query: 3, Limit: 500, Total: 3
Reset
Add
Name
Network
Created
Modified
Description
RTR_Engr
Edit
Engineering
8/25/2003
8/25/2003
Engineering Router
Edit
Acme
8/28/2003
8/28/2003
HQ Gateway
RTR_Main
Edit
Acme
8/25/2003
8/25/2003
Acme Main Router
Interface
Name
Network
Connection
Address
Description
E0
Hub C Port 12
S0
S1
3402
Done
Internet
3400

Fig 34

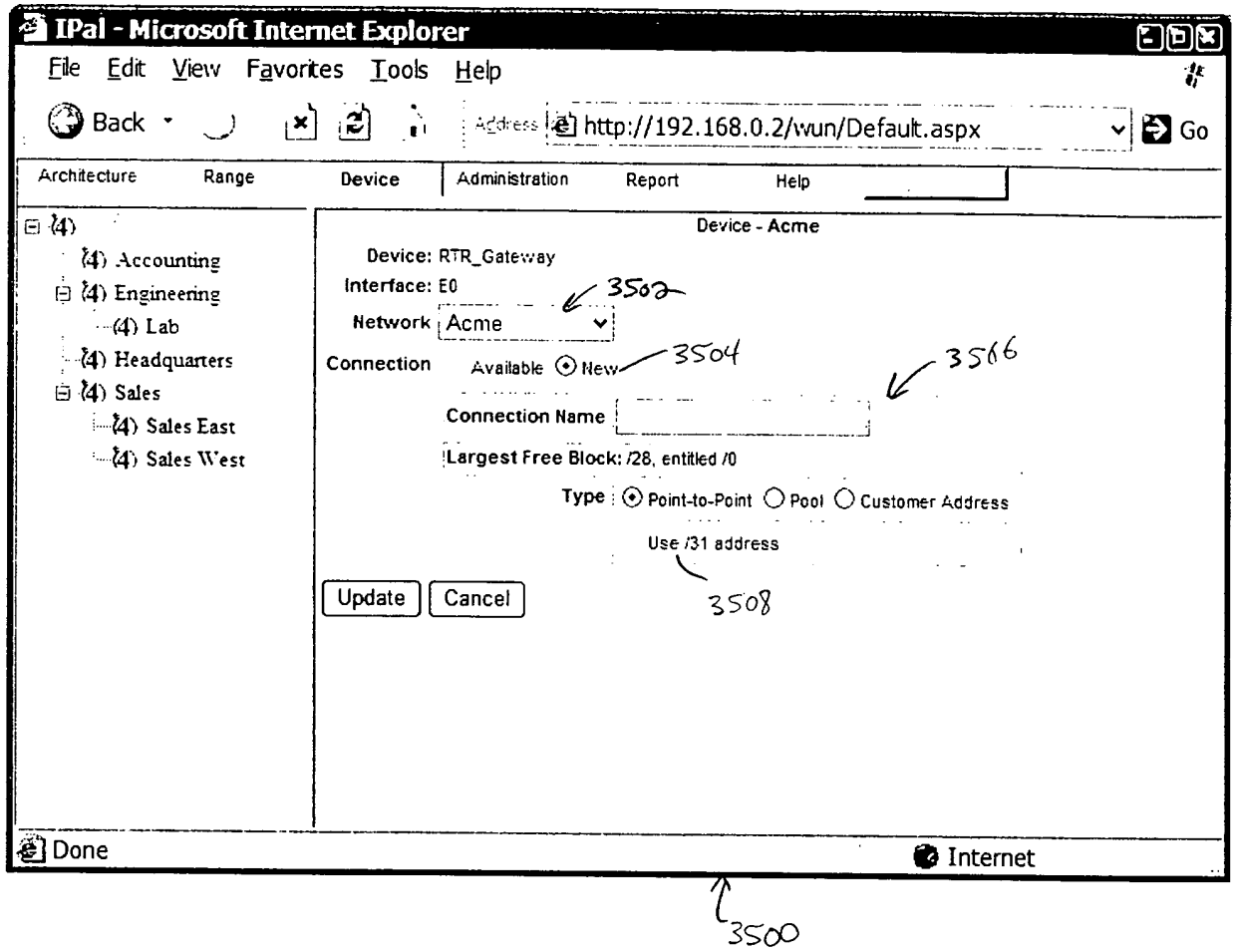

IPal - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back
Address http://192.168.0.2/wun/Default.aspx
Go
Architecture Range Device Administration Report Help
(4)
(4) Accounting
(4) Engineering
(4) Lab
(4) Headquarters
(4) Sales
(4) Sales East
(4) Sales West
Device - Acme
Device: RTR_Gateway
Interface: E0
Network Acme
Connection Available New
Connection Name
Largest Free Block: /28, entitled /0
Type Point-to-Point Pool Customer Address
Use /31 address
Update Cancel
3502
3504
3506
3508
3500
Done
Internet

Fig 35